

made. FRA would expect a railroad to consider the guidance contained in this paragraph when making its decisions on where equipment containing brake defects will be repaired. The guidance contained in this paragraph is based upon, and consistent with, the voluminous case law which exists that establishes the guiding principles for determining whether a location constitutes a location where the necessary repairs can be made as well as previous enforcement actions taken and guidance provided by FRA regarding such locations. The final rule guidance incorporates the principles discussed in the "Overview of Comments and General FRA Conclusions" portion of the preamble under the heading "Movement of Equipment with Defective Brakes."

Paragraph (g) provides a method by which a railroad may designate locations where various brake system repairs will be conducted. Although FRA does not believe that railroads should be permitted to unilaterally designate locations where brake system repair will be conducted, FRA does believe that a railroad in cooperation with its employees could potentially develop a plan that designates locations where brake system repairs will be effectuated. This paragraph makes clear that such a plan would have to be consistent with the guidelines contained in paragraph (f) and that such plans would have to be approved by FRA prior to being implemented. This paragraph also makes clear that for FRA to entertain a proposal containing a plan which designates locations where brake system repairs will be conducted a railroad and representatives of its employees must submit the proposal jointly. FRA does not intend to consider proposals nominally submitted pursuant to this provision that are not supported by a railroad's employees and their representatives.

#### *Section 223.17 Special Approval Process*

This section contains the procedures to be followed when seeking to obtain FRA approval of a pre-revenue service acceptance plan under § 232.505 for completely new brake system technologies or major upgrades to existing systems or when seeking approval of an alternative to the test standard incorporated in §§ 232.305 or 232.307. Several railroads and manufacturers contended, both in response to the 1994 NPRM and at the RSAC Working Group meetings, that FRA needed to devise some sort of quick approval process in order to permit the industry to make

modifications to incorporated standards or existing equipment based on the emergence of new technology. Thus, FRA proposed an approval process it believed should speed the process for taking advantage of new technologies over that which is currently available under the waiver process. However, in order to provide an opportunity for all interested parties to provide input for use by FRA in its decision making process, as required by the Administrative Procedure Act, FRA believes that any special approval provision must, at a minimum, provide proper notice to the public of any significant change or action being considered by the agency with regard to existing regulations.

This section essentially retains the proposed special approval process. One private car owner commented that the procedures should require FRA to publish any petition received within 30 days of receipt and to rule on the petition within 30 days of receipt of the last comment. Certain representatives of rail labor asserted that the special approval procedures should be tightened to be consistent with the requirements for granting a waiver and that the comment period should be extended and expanded to provide adequate time for parties to prepare. As the special approval process only applies to pre-revenue testing plans and the procedures for conducting single car and repair track air brake tests and because the purpose of the process is to speed the decision making process, FRA does not believe it is necessary to further lengthen the comment periods proposed in the NPRM, and FRA thinks that the procedures provide an adequate opportunity for interested parties to comment. Furthermore, if the procedures for these special approvals are made overly burdensome then the speed intended to be gained through the process would be lost. However, FRA also does not believe that the proposed time frames provided for FRA's consideration of a petition should be reduced. FRA believes that the time frames included in the proposal for FRA consideration are necessary for FRA to fully consider all comments and information received.

#### *Section 232.19 Availability of Records*

This section makes clear that unless otherwise provided by this part, the records and plans required to be developed and maintained by this part shall be made available to representatives of FRA and States participating under part 212 of this chapter for inspection and copying upon request. FRA has added this

section to the final rule in order to specifically clarify the availability of such records while increasing the readability of the rule and reducing the unnecessary repetition of the requirement throughout the text of the rule.

#### *Section 232.21 Information Collection*

This section indicates the provisions of this part that have been approved by the Office of Management and Budget for compliance with the Paperwork Reduction Act of 1995. See 44 U.S.C. 3501 *et seq.* A more detailed discussion of the information collection requirements contained in this part is provided in the "Regulatory Impact" portion of this preamble.

### **Subpart B—General Requirements**

#### *Section 232.101 Scope*

This section contains a formal statement of the scope of this specific subpart of the final rule. This subpart is intended to establish general operating, performance, and design standards for railroads that operate freight or other non-passenger trains and further contains specific requirements for equipment used in these types of operations.

#### *Section 232.103 General Requirements for All Train Brake Systems*

This section contains general requirements that are applicable to all freight and non-passenger train brake systems. This section specifically includes certain basic train brake system practices and procedures that form the foundation for the safe operation of all types of trains. Some of these basic principles are so obvious that they have not been specifically included in past rules. For example, paragraphs (a)-(c) state the most basic safety requirements for all train brake systems, which include having the ability to stop a train within the existing signal spacing, maintaining and monitoring the integrity of the train brake communication line, and having the train brake system respond as intended to signals from the brake communication line. These basic requirements were proposed in the NPRM and have been retained in this final rule without change.

Paragraph (d) contains the provision requiring trains to have 100 percent operative and effective power brakes prior to use at, or departure, from certain locations and prohibiting the hauling of a car with inoperative or ineffective power brakes from certain under 49 U.S.C. 20303. Paragraph (d) has been slightly modified from that

proposed in the NPRM in order to clarify that the requirement applies only to trains that are required to receive a Class I brake test at the location. This modification was made in order to specifically clarify that the 100 percent operative brake requirement is not intended to apply to transfer trains that originate at a location where the necessary brake repairs cannot be effectuated. FRA agrees with the concerns raised by various commenters that the proposed language could have been interpreted as applying to transfer trains. FRA agrees that the 100 percent requirement does not currently apply to such trains, and it was not FRA's intention when issuing the NPRM to extend its application to such trains. However, it should be noted that if a transfer train originates at a location where repairs to the equipment containing defective brakes can be effectuated, then the train would be required to have 100 percent operative brakes prior to being used or departing that location.

Contrary to the contentions of certain commenters, FRA continues to believe that there is adequate justification for retaining the 100 percent requirement. The requirement to have 100 percent operative brakes prior to departing a location where an initial terminal brake test is required to be performed has existed in the railroad industry for decades. FRA believes it is not only wise from a safety standpoint, as it ensures the proper operation of a train's brake system at least once during its existence, but the requirement sets the proper tone for what FRA expects to be accomplished at these locations. FRA believes that requiring 100 percent operative brakes on trains at their origin provides the railroads with a margin for failure of some brakes while the train is in transit (up to 15 percent) and tends to ensure that defective equipment is being repaired in a timely fashion. In addition, FRA believes that the 100 percent requirement is consistent not only with Congress' understanding of the AAR inspection standards that were adopted in 1958, but also with the intent of FRA, rail management, and rail labor as to what was to occur at initial terminals when the inspection interval was increased from 500 miles to 1,000 miles in 1982. At that time, carrier representatives committed to the performance of quality initial terminal inspections in exchange for an extension in the inspection interval, for which FRA intends to hold them accountable.

Some commenters recommended that FRA permit any and all trains that have 95 percent operative brakes to operate

from their point of origin to destination and noted that Canada currently allows such operation. FRA believes that such an approach would be completely contrary to the existing statutory mandate regarding the movement of equipment with defective brakes. The existing statutory provision regarding the movement of equipment with defective brakes requires that such equipment be repaired at the nearest location where the necessary repairs can be performed. *See* 49 U.S.C. 20303. Consequently, trains that originate at or that operate through locations where the necessary brake repairs can be effectuated are clearly required by the statute to have 100 percent operative brakes prior to departing those locations.

FRA realizes that the 100 percent requirement creates a somewhat illogical situation at some locations by requiring certain trains to have 100 percent operative brakes prior to departing the location and yet allowing other trains to pick up defective equipment at the same location. However, FRA believes that various safety benefits are created by retaining the 100 percent requirement. The public is assured that a train's brake system is in near perfect condition at the beginning of its journey, train crews are more cognizant of the presence of defective cars in the train when they are picked up en route, railroads are more likely to perform repairs at a location where trains are initiated in order to avoid breaking up trains to set out defective cars once the trains are assembled, and FRA retains a clear and consistent enforcement standard that can be easily understood by its inspectors and railroad industry employees.

Although FRA recognizes that the 100 percent requirement may be somewhat burdensome for some railroads at certain locations, FRA believes that the number of locations involved is relatively low and should be handled on a case-by-case basis through the existing waiver process. FRA believes that many railroads have created their own problems by eliminating repair facilities and personnel at many of the outlying locations that the railroads now claim they lack the ability to make appropriate repairs. Furthermore, FRA believes that the best method of assessing the safety implications of permitting a location to operate trains with less than 100 percent operative brakes is for the railroad to provide information on how the railroad will handle the defective equipment based on the specific needs and operating characteristics of the railroad involved.

In the NPRM, FRA provided various approaches under which it would potentially consider allowing a railroad to operate trains from their initial terminals with less than 100 percent operative brakes. *See* 63 FR 48310. The methods suggested by FRA were rejected as being overly burdensome by several commenters. Therefore, FRA believes the burden falls on each railroad seeking relief from the 100 percent requirement at certain outlying locations to provide FRA with an operating plan that will ensure the safe operation of such trains and provide for the timely and certain repair of any defective equipment moved from those locations. Consequently, FRA believes that there are a few existing locations that may be candidates for receiving a waiver from the 100 percent requirement, and FRA is willing to consider waivers for such locations; however the railroads applying for such waivers must be able to establish a true need for the exception and must be willing to provide alternative operating procedures that ensure the safety of the trains being operated from those locations.

Paragraph (e) contains a clear and absolute prohibition on train movement if more than 15 percent of the cars in a train have their brakes cut out or have otherwise inoperative brakes. Although there is no explicit limit contained in the statute regarding the number of cars with inoperative brake equipment that may be hauled in a train, the 15-percent limitation is a longstanding industry and agency interpretation of the hauling-for-repair provision currently codified at 49 U.S.C. 20303, and has withstood the test of time. This interpretation is extrapolated from another statutory requirement which permits a railroad to use a train only if "at least 50 percent of the vehicles in the train are equipped with power or train brakes and the engineer is using the power or train brakes on those vehicles and on all other vehicles equipped with them that are associated with those vehicles in a train." 49 U.S.C. 20302(a)(5)(B). As originally enacted in 1903, section 20302 also granted the Interstate Commerce Commission (ICC) the authority to increase this percentage, and in 1910 the ICC issued an order increasing the minimum percentage to 85 percent. *See* 49 CFR 232.1, which codified the ICC order. One labor representative recommended that this requirement be eliminated as it creates confusion regarding the movement of defective equipment. FRA believes that if the rule is read in its entirety there should be no

confusion as to the movement of defective equipment, and that this provision merely sets an outside limit on the percentage of cars that may be hauled in any train with inoperative brakes. Consequently, FRA believes the express prohibition is necessary and will continue to require that equipment with inoperative air brakes make up no more than 15 percent of any train.

As virtually all freight cars are presently equipped with power brakes and are operated on an associated trainline, the statutory requirement cited above is in essence a requirement that 100 percent of the cars in a train have operative power brakes, unless being hauled for repairs pursuant to 49 U.S.C. 20303. Therefore, paragraph (f) makes clear that a train's air brakes shall be in effective and operable condition unless a car is being hauled for repairs pursuant to the conditions contained in § 232.15. This section retains the proposed standard for determining when a freight car's air brakes are not in effective operating condition based on piston travel. The piston travel limits for standard 12-inch stroke brake cylinders are the same as currently required under § 232.11(c). Certain labor representatives asserted that the permissible piston travel for these brake cylinders should be reduced to 10 inches rather than the currently allowed 10½ inches. These commenters provided no technical data to support such a change, and FRA is not aware of any problems or unsafe conditions resulting from the current 10½ inch piston travel allowance on such brake cylinders. Consequently, the final rule retains the existing piston travel limits for standard 12-inch stroke brake cylinders.

Due to the proliferation of equipment with other than standard 12-inch stroke brake cylinders, FRA has found that mechanical forces and train crew members performing brake system inspections often do not know the acceptable range of brake piston travel for this non-standard equipment. In an attempt to improve this situation and to ensure the proper operation of a car's brakes after being inspected, FRA proposed that vehicles equipped with other than standard 12-inch stroke brake cylinders have either the badge plate for the vehicle or a stencil, sticker, or marker indicate the acceptable range of piston travel for the brake equipment on that vehicle. FRA also proposed that the information on the badge plate, sticker, stencil, or marker include both the permissible brake cylinder piston travel range for the vehicle at Class I brake tests and the lengths at which the piston travel renders the brake ineffective.

Paragraph (g) generally retains these proposed requirements. FRA continues to believe that this information is essential in order for a person to properly perform the brake inspections contained in this final rule due to the growing number of cars with other than standard brake designs. The requirement has been slightly modified from that proposed to require that the outside piston travel limit need only be provided if it is different from the Class I brake test limit. FRA agrees with the contentions of certain commenters that such information would be unnecessarily redundant if the limits are the same. Thus, if there is no outside limit indicated on the badge plate, stencil, sticker, or marker the piston travel limits indicated for the Class I/initial terminal brake test for the vehicle will be considered the outside piston travel limits for that vehicle.

The AAR recommends that, in addition to vehicles equipped with standard 12-inch stroke brake cylinders, FRA should also exempt vehicles equipped with WABCOPAC or NYCOPAC truck-mounted brake cylinders from the marking requirements contained in paragraph (g). The AAR contends that the stenciling or marking of the piston travel limits on these vehicles is unnecessary because the piston travel limits for these brake systems are well-known and nearly 30 percent of the fleet is equipped with them. FRA disagrees with this contention. Based on FRA's experience in monitoring the performance of various brake tests, FRA believes that many employees are not aware of the piston travel limits for the brake systems noted above. Furthermore, there are numerous truck-mounted brake cylinders currently in use that have piston travel limits which are different from those of the WABCOPAC and NYCOPAC truck-mounted systems. Thus, FRA believes all vehicles equipped with these brake systems need to be marked in order to avoid confusion by individuals inspecting the equipment and thus ensure the proper operation of the brakes on such cars. Moreover, FRA is aware that many vehicles equipped with the type of truck-mounted brake systems sought to be exempted by AAR, particularly privately owned vehicles, already have decals, stickers, or stencils containing the information required by this paragraph.

The AAR also recommends that railroads be provided eight years in which to implement the marking requirements contained in this paragraph in order to perform the work during the required periodic single car

or repair track air brake tests. FRA believes such an allowance of time is unnecessary and excessive. The reason FRA is permitting the information to be marked on the car with either a decal, stencil, or sticker is to provide the railroads with relatively simple and easy methods for bringing cars into compliance without requiring them to be placed in a maintenance facility or on a repair track to have the information affixed. FRA believes that the three-year applicability period provided by this final rule provides railroads with sufficient time to mark cars as required. Furthermore, many cars are already properly marked with the necessary information as noted in the previous discussion.

Paragraph (h) requires that all equipment ordered or placed in service for the first time on or after the specified dates, be designed not to require an inspector to place himself or herself on, under, or between components of the equipment to observe brake actuation or release. This paragraph allows railroads the flexibility of using a reliable indicator in place of requiring direct observation of the brake application or piston travel because the designs of some freight car brake systems make direct observation extremely difficult unless the inspector places himself or herself underneath the equipment. Indicators of brake system piston travel or piston cylinder pressure have been used with satisfactory results for many years. Although indicators do not provide 100 percent certainty that the brakes are effective, FRA believes that they have proven themselves effective enough to be preferable to requiring an inspector to assume a dangerous position. Some commenters recommended that the indicator alternative be eliminated and that railroads should not be allowed to rely on indicators. FRA believes that these commenters fail to recognize the need to provide some alternative to direct observation of the piston travel on certain equipment and fail to acknowledge the existence of new technologies available to the industry. Further, although the rule permits the use of an indicator for purposes of determining piston travel, the individual inspecting such equipment would be required to inspect all components of the brake system for proper operation.

This requirement stems primarily from the brake system design of double-stack equipment currently used by several larger freight operations. Several commenters have indicated that the functioning of the brakes on this type of equipment cannot be observed without

inspectors placing themselves in potentially dangerous positions. In addition, a complete inspection of the brake equipment and systems used on double-stack equipment is time consuming. Consequently, inspectors are reluctant to conduct a complete brake inspection test on departing trains that contain this type of equipment. FRA thinks that double-stack equipment is becoming a mainstay of the freight railroad industry and that this design deficiency must be corrected. Thus, FRA has attempted to make this a performance requirement by simply specifying how the equipment must function and allowing the industry to determine the method of compliance.

Paragraph (i) retains the proposed requirement that an emergency brake application feature be available at any time and that it produce an irretrievable stop. This section merely codifies current industry practice and ensures that all equipment will continue to be designed with an emergency brake application feature. In the 1994 NPRM on power brakes, FRA proposed a requirement that all trains be equipped with an emergency application feature capable of increasing the train's deceleration rate a minimum of 15 percent. *See* 59 FR 47729. This proposed requirement merely restated the emergency specification currently contained in Appendix B to part 232. Comments received in response to that proposal indicated that some brake equipment currently in use or being developed could provide a deceleration rate with a full service application that is close to the emergency brake rate and that the proposed requirement would require the lowering of full service brake rates, thereby compromising safety and lowering train speeds. Consequently, the requirement proposed in the 1998 and retained in this final rule removes the 15-percent differential.

Paragraphs (j) and (k), which were proposed as paragraphs (k) and (l), impose on the railroads the responsibility for determining maximum air brake system working pressure and maximum brake pipe pressure. These provisions were contained in both the 1994 and 1998 NPRM, and FRA received no comments objecting to their inclusion. *See* 59 FR 47743. Thus, FRA intends to continue to allow individual railroads the wide latitude currently permitted in determining these pressures.

Paragraph (l), previously proposed as paragraph (m), provides that except as provided by other provisions of this part, all equipment used in freight or other non-passenger trains shall, at a minimum, meet the performance

specification for freight brakes in AAR standard S-469-47. The AAR standard incorporated by reference in this paragraph contains all the provisions currently referenced in § 232.3 and contained in existing Appendix B to part 232. In the NPRM, FRA sought comments from interested parties as to the necessity of referencing these standards as well as any information on any updated standards related to the performance of freight equipment that is currently being used throughout the industry. Although one commenter generally asserted that the standards should merely be included as a reference and that their inclusion would require retroactive validation of proven designs, FRA finds little merit in this contention since any existing equipment should already be designed to the specifications as they are currently part of the existing regulations. Except as noted below, FRA received no comments seeking specific changes to the referenced specifications or other objections to their inclusion.

It should be noted that the provision previously proposed in paragraph (j) of this section requiring that the air brake components that control brake application and release be adequately sealed to prevent contamination by foreign material (63 FR 48359) has been removed due to its incorporation in another provision contained in this final rule. As the proposed requirement is contained in AAR standard S-469-47 as one of the general specification requirements, there is no reason to retain the specific requirement in this final rule. Thus, although the requirement has been specifically removed from the rule text, it is retained by its inclusion in the referenced AAR standard. Furthermore, FRA finds AAR's objection to this requirement somewhat hard to understand. FRA is not imposing a new requirement but merely sets forth an existing requirement contained in an AAR standard. Contrary to the concerns raised by AAR, FRA does not intend to change the existing standard of compliance for this requirement.

Paragraph (m), previously proposed as paragraph (n), retains the proposed requirement that if an en route train qualified by the Air Flow Method experiences a brake pipe air flow of greater than 60 CFM or brake pipe gradient of greater than 15 psi and the movable pointer does not return to those limits within a reasonable time the train must be stopped at the next available location and inspected for leaks in the brake system. This requirement one of the conditions of the general waiver granted to the AAR allowing the use of

the air flow method to qualify train air brakes. FRA believes that this requirement is necessary to prevent trains with excessive leakage from continuing to operate. If a train has excessive leakage, the engineer may lack the ability to stop the train using the air brake system. Other than the general contention raised by certain labor representatives that the Air Flow Method not be allowed, FRA received no specific comments on the requirements contained in this paragraph.

Paragraph (n), previously proposed as paragraph (o), contains requirements regarding the setting and releasing of hand brakes on equipment that is left unattended. The requirements contained in this paragraph differ from those previously proposed in the NPRM. In the NPRM, FRA proposed various requirements for securing standing equipment. The requirements proposed in the NPRM were basically a reiteration of the guidance issued by FRA in Safety Advisory 97-2 on September 15, 1997. *See* 62 FR 49046. The securement guidance contained in Safety Advisory 97-2 was based upon FRA's review of an incident that occurred on August 20, 1997 near Fort Worth, Texas, and its awareness of other incidents involving the improper securement of rolling equipment. The Safety Advisory was issued in order to provide the industry with some assistance and guidance regarding securement procedures and to provide information on current practices of the industry related to the securement of rolling stock. *Id.*

The requirements proposed in the NPRM where also intended to address the practice known as "bottling the air" in a standing cut of cars, an issue related to improperly secured rail equipment. The practice of "bottling the air" occurs when a train crew sets out cars from a train with the air brakes applied and the angle cocks on both ends of the train closed, thus trapping the existing compressed air and conserving the brake pipe pressure in the cut of cars they intend to leave behind. This practice has the potential of causing, first, an unintentional release of the brakes on these cars and, ultimately, a runaway. Many railroad operating rules require that a 20-pound reduction in brake pipe pressure be made when stopping a train to remove a cut of cars from the train. Thus, if the trainman closes the angle cock where the cut is to be made before pressure equalizes in the trainline, an air wave action may form that can be of sufficient amplitude to initiate an unintentional release of the brakes.

Brake pipe gradient is another factor that makes bottling the air dangerous. "Normal gradient" is a term used to express the difference between the higher pressure on the front end of the train and the lower pressure on the rear end of the train, which is dependent upon brake pipe leakage and train length. Each train establishes its own normal gradient value. "Inverse gradients" and "False gradients" are temporary gradients that are a result of brake operations. Inverse gradients occur when a brake pipe reduction is made, temporarily making the brake pipe pressure higher on the rear of the train. The false gradient is created anytime the train brakes are set and released, thus temporarily resulting in a higher than normal pressure differential between the front and rear end of the train as the brake pipe charges. Therefore, if the engineer sets and releases a train's brakes a sufficient number of times prior to stopping to remove a cut of cars, a false gradient could be established. Even if the engineer made a 20-pound brake pipe reduction and listened for the air to stop exhausting at the automatic brake valve before giving the signal to the trainman to cut off the cars, the potential exists for an unintentional release of air brakes if the air on the cars is bottled. The false gradient could be of such magnitude that, as the trainline attempts to equalize, the higher pressure on the front end flowing to the rear will exceed the 1½ pound differential across the service piston and cause a release of air brakes. An inverse gradient can also create an unintentional release of brakes. As brake pipe pressure is reduced at the front of the train, the rear end temporarily has a higher pressure. As the trainline attempts to equalize, the pressure on the front end will rise. In some circumstances, this rise could be enough to initiate a release of air brakes.

On June 5, 1998, the NTSB issued the following recommendation to FRA:

Issue a regulation that requires the brake pipe pressure to be depleted to zero and an angle cock to remain open on standing railroad equipment that is detached from a locomotive controlling the brake pipe pressure.

(R-98-17). This recommendation was the result of NTSB's investigation of an incident that occurred on January 27, 1997, on the Apache Railway near Holbrook, Arizona. The incident involved the runaway of 77 cars down a 1.7 percent grade for 14 miles resulting in the eventual derailment of 46 cars and the release of hazardous materials. Although there were no fatalities, 150 people were evacuated

from nearby residential areas. The NTSB determined that the 77 cars rolled away unattended because the conductor of the train had trapped the air in the brake system, i.e., "bottled the air," which resulted in an undesired release of the brakes on the standing cars. In its recommendation the NTSB correctly noted that FRA statistics show that ten accidents occurred between 1994 and 1995 which were attributable to the practice of "bottling the air."

FRA received numerous comments from the AAR and various other representatives of the railroads objecting to the proposed provisions regarding the securement of standing equipment. Although these commenters generally agreed with the intended purpose of the proposed requirements, they believed that the proposed provisions were overbroad, increased certain safety hazards, and exposed railroad employees to higher risk of injury. These commenters contend that the goals of FRA could be accomplished in a less burdensome fashion while increasing safety and reducing the potential for employee injuries. After reviewing the comments submitted by these parties, FRA agrees with most of the recommendations provided. Consequently, the provisions contained in this paragraph have been modified to reflect those recommendations.

FRA agrees with the recommendation that the requirements contained in this paragraph should be applied only to unattended equipment rather than to standing equipment generally. FRA agrees that, if the train is attended, the setting of handbrakes serves no useful purpose and would result in an enormous cost to the industry. Therefore, paragraph (n) contains a definition of "unattended equipment" to clarify the applicability of the requirements contained in this paragraph. The term covers equipment left standing and unmanned in such a manner that the brake system of the equipment cannot be readily controlled by a qualified person.

FRA also agrees that the proposed requirement that railroads develop a matrix to determine the number of hand brakes that are to be applied may not be the best approach to ensure that a sufficient number of hand brakes have been applied to a specific cut of unattended equipment. FRA agrees that the number of hand brakes required to be applied depends on a wide variety of factors not easily captured in a matrix format and that a matrix approach might result in either too few or too many hand brakes being applied. Thus, paragraph (n)(1) eliminates the requirement for developing a matrix and

is modified to include a performance-based requirement that a sufficient number of hand brakes be applied to hold the equipment and a requirement that railroads develop and implement a process or procedure to verify that the applied hand brakes will sufficiently hold the equipment when the air brakes are released. This requirement will permit a railroad to develop appropriate operating rules to verify the sufficiency of the handbrakes applied which can be tailored to the specific territory and equipment operated by the railroad. On some railroads and at some locations, these operating rules may include the use of a matrix or some other type of set calculation.

Paragraph (n)(2) addresses the issue of "bottling air" on unattended equipment. This paragraph requires that an emergency brake application be initiated on all equipment prior to its being left unattended. This paragraph no longer requires that the locomotive be detached to effectuate the emergency application as was proposed. FRA agrees with the concerns raised by certain parties that the proposed requirement to detach locomotives to allow an emergency application of the brakes is not appropriate or desirable in many circumstances. FRA agrees that it is not necessary to detach locomotives to initiate an emergency application, that it is safer to leave the locomotives attached due to redundant securement features on a locomotive, that an emergency application should not be made until it is known that the number of hand brakes set is sufficient, and that it would be very burdensome to detach locomotives every time a train is left unattended.

Paragraphs (n)(3) and (n)(4) contain the requirements for securing unattended locomotives. FRA agrees with the recommendations made by various commenters that the proposed requirements regarding locomotive securement were over broad by failing to distinguish among (i) locomotives in the lead consist of a train, (ii) distributed power locomotives, and (iii) locomotives within yard limits. FRA agrees that these securement requirements contained in this final rule should not apply to distributed power locomotives. Consequently, these paragraphs establish specific securement requirements that apply only to locomotives in the lead consist of a train and are based on the location of the locomotive or locomotive consist when it is being left unattended.

Paragraph (n)(5) retains the proposed and existing requirement that any hand brakes applied to secure unattended equipment not be released until it is

known that the air brake system is properly charged.

It should be noted that paragraph (n) reflects FRA's agreement with the various concerns raised regarding the proposed requirements to use derails to secure unattended equipment and to chock and chain locomotives when left unattended on certain grades. FRA agrees that the use of derails, as proposed in the NPRM, could potentially create safety hazards if not properly removed and might expose employees to a greater potential for injury by increasing the handling and movement of derails. FRA also agrees that if handbrakes are properly applied on unattended locomotives there is little need to chock and chain locomotive wheels in most instances and such a requirement merely creates the potential of exposing railroad employees to unnecessary risks. Furthermore, FRA believes that the alternative approach submitted by the CAPUC regarding when and where derails should be applied is too complicated, requires further research, and might require unnecessary securement in many instances. Thus, the approach taken in this final rule is to provide requirements for the setting of hand brakes and require railroads to ensure the capability of those hand brakes to hold the equipment. If the applied hand brakes do not adequately hold the equipment, FRA would expect the railroad to utilize other methods of securement such as derails, skates, chains, and chocks.

Paragraph (o), previously proposed as paragraph (p), requires that air pressure regulating devices be adjusted in accordance with the air pressures contained in the chart contained in this paragraph. The chart is very similar to that proposed in the NPRM, but has been slightly modified in response to the comments received. The references to equipment used in passenger operations has been eliminated, and the pressure of the self-lapping portion for independent air brake has been modified to read "30 psi or less" rather than the proposed "30-72 psi."

Paragraph (p) contains the proposed provision regarding the joint responsibility of supervisors and inspectors to ensure the proper condition and functioning of train brake systems. The provision contained in this paragraph has been slightly modified in order to remain consistent with the existing requirement regarding such joint responsibility contained at § 232.11(a). These modifications clarify that joint responsibility exists to the extent that it is possible to detect defective equipment by the inspections and tests required by this part.

#### *Section 232.105 General Requirements for Locomotives*

For the most part, this section contains general provisions related to locomotives that are either currently contained in § 232.10 or that were previously proposed in the NPRM. As discussed in detail in the NPRM, FRA does not intend to include provisions in this final rule related to the inspection and maintenance of locomotive braking systems. FRA believes that these requirements are adequately addressed in part 229 and would only add to the complexity of this rule and potentially cause confusion or misunderstanding by members of the regulated community. Therefore, while many of the requirements currently contained in § 232.10 are no longer necessary as they are adequately addressed in part 229, paragraphs (a) and (c) are provisions currently contained in § 232.10 which FRA believes need to be retained. See 49 CFR 232.10(b) and (f)(2).

Paragraph (c) retains the proposed requirement that the hand or parking brake on a locomotive be inspected and repaired, if necessary, at least every 368 days. It should be noted that paragraph (c) has been slightly modified from that proposed in order to allow the date of the last inspection of the hand brake to be entered on Form FRA F 6180-49A in lieu of stenciling such information on the car. As the current regulation permits either the stenciling or tagging of a locomotive with this information and because many railroads currently record the information on the form noted above, FRA believes it is appropriate to continue to allow such a practice. FRA continues to believe that this inspection requirement will have little or no impact on railroads as this inspection is intended to coincide with the annual locomotive inspection required under § 229.27 and many railroads currently inspect these devices at this annual inspection. FRA also continues to believe that a thorough inspection of these devices on an annual basis is sufficient to ensure the proper and safe functioning of the devices.

Paragraph (b) retains the proposed requirement that locomotives ordered or placed in service for the first time after the specified dates be equipped with a hand or parking brake. Although the final rule retains the requirements that the hand or parking brake be capable of being set and released manually, the final rule modifies the requirement regarding the holding capability of such brakes. Rather than requiring that the brake be capable of holding the equipment on the maximum grade anticipated by the operating railroad,

the final rule requires that the brake be capable of holding the equipment on a three-percent grade. Based on information provided by several locomotive manufacturers, FRA agrees that current locomotive hand and parking brakes are designed to achieve a three-percent holding capacity and that current operating practices are based on this capacity. Several manufacturers assert that if the holding capacity of these brakes had to be increased, then the cost of a locomotive would increase significantly as such an increase would require redesign of the foundation brake rigging. As the current designs have provided adequate safety and the enhanced design would be very expensive relative to the improvement in safety, this paragraph has been amended to require that the hand or parking brake be capable of holding the unit on a three percent grade.

A hand or parking brake is an important safety feature that prevents the rolling or runaway of parked locomotives. The requirements contained in this paragraph represent current industry practice. In the 1994 NPRM on power brakes, FRA proposed requiring that a hand brake be equipped on locomotives. See 59 FR 47729. FRA received several comments to that proposal suggesting that the term "parking brake" be added to the requirement since that is what is used on many newly built locomotives. A parking brake generally can be applied other than by hand, such as by spring pressure, by air pressure when the brake pipe air is depleted, or by an electrical motor. Parking brakes usually incorporate some type of manual application or release feature, although these features are generally more difficult to operate. FRA believes that parking brakes are the functional equivalent of a traditional hand brake and are capable of providing a similar level of security to stationary equipment. Consequently, FRA added the term "parking brake" to the 1998 NPRM and has retained the term in this final rule.

In paragraph (d), FRA requires that the leakage of air from equalizing reservoirs on locomotives and related piping be zero. The equalizing reservoir contains the controlling volume of air pressure, which is set to a desired pressure by the locomotive engineer by setting the regulating valve (also known as the "feed valve") on the automatic air brake system. When the automatic brake valve handle is moved to the release position, air supplied from the locomotive air compressor and the main air reservoirs is supplied to the equalizing reservoir through the

regulating valve. The brake pipe pressure will then be charged to the level of the air pressure contained in the equalizing reservoir. When an application of the train brakes is desired, the engineer moves the automatic brake valve handle into the application zone. The movement of the brake valve handle into the application zone shuts off the supply of air from the regulating valve to the equalizing reservoir, leaving the volume of air trapped in the equalizing reservoir. The pressure of the trapped air can then be reduced to a desired amount by movement of the automatic brake valve handle. This will result in the brake pipe pressure responding and being reduced to a pressure equal to the pressure contained in the equalizing reservoir. Furthermore, the air pressure in the brake pipe on most freight equipment will be maintained at the pressure in the equalizing reservoir due to the maintaining features of the brake system. Consequently, any leakage from the equalizing reservoir will affect the maintaining feature of the automatic air brake, causing the engineer to lose the ability to effectively maintain control of the brake pipe pressure and, thus, affecting the ability of the engineer to safely control the train in some circumstances.

One manufacturer of locomotives commented on the requirement contained in this paragraph, contending that the requirement should not be applied to locomotives utilizing electronic braking systems because such leakage is not detectable by the locomotive engineer. This commenter contends that on these types of braking systems a continuous demand is made on the compressor to offset any leakage and if the compressor cannot offset the leakage the engineer is notified and the train is automatically stopped if necessary. Thus, the systems are designed to be fail-safe in the event of excessive leakage. This commenter believes that FRA should recognize these types of designs and except them from the requirement contained in this paragraph.

FRA agrees that the electronic brake systems currently in use on some locomotives are designed to maintain equalizing reservoir pressure at a set limit. Because these systems are designed to offset equalizing reservoir leakage, the locomotive engineer would not experience any problem with the operation of the train's brakes if a minor leak occurs. However, if the leakage exceeds the ability of the system to maintain the pressure, a fault message would be displayed to the locomotive

engineer and the train's brakes would be automatically applied, if necessary. Therefore, this section has been slightly modified from that proposed in the NPRM to allow locomotives that are equipped with these types of maintaining features to continue to operate with some leakage in the equalizing reservoir. However, this section makes clear that when such systems identify an equalizing reservoir leak, the railroad is to perform the repairs necessary to eliminate the leakage at the nearest forward location where such repairs can be made. Generally a leakage on these electronic braking systems will be discovered when maintenance personnel review the fault screen during routine inspections and tests. Therefore, if a locomotive is equipped with a braking system that has the ability to maintain equalizing reservoir pressure, with the automatic brake valve set in the freight position or direct release, an equalizing reservoir leak will generally not be required to be repaired until it is either identified by the inspection forces or until the locomotive engineer identifies the condition during the normal operation of the train.

In paragraph (e), FRA retains the proposed prohibition on the use of "feed or regulating valve braking," in which reductions and increases in the brake pipe pressure are effected by manually adjusting the feed valve. "Feed valve braking" has been recognized by both the railroad industry and FRA as an unsafe practice. Most railroads already have some type of operating rule prohibiting this type of braking. No comments were received objecting to the inclusion of this prohibition in response to the NPRM.

In paragraph (f), FRA also retains the proposed prohibition on the use of the "passenger" position on the locomotive brake control stand on conventional freight trains when the trailing equipment is not designed for graduated brake release. The "passenger" position was intended only for use with equipment designed for graduated brake release. Therefore, use of the "passenger" position with other equipment can lead to potentially dangerous situations where undesired release of the brakes can easily occur due to the slightest movement of the automatic brake valve. In FRA's view, the only situation when the use of the passenger position might become necessary to safely control a train is when equalizing reservoir leakage occurs en route. If such a situation arises, this paragraph makes clear that the train may move only to the nearest forward location where the equalizing

reservoir leakage can be corrected. No objections were received by FRA in response to the NPRM with regard to these requirements.

Paragraph (g) contains an existing requirement which was inadvertently excluded from the NPRM. This paragraph makes clear that engineers must know that the brakes on locomotives of which they are taking charge are in operative condition. This requirement is currently contained at § 232.10(l). Thus, FRA is not imposing a new burden by incorporating this requirement into the final rule. Furthermore, FRA does not intend to create a new inspection requirement by including this provision, but intends for it to be applied and enforced in the same manner as the existing requirement. If a locomotive engineer relieves another engineer, the condition of the brakes could be determined, based on a conversation or report from the engineer being relieved. The railroad may also elect to have mechanical forces inspect the locomotive for proper operation of the brakes and have the locomotive engineer accept the locomotives based on the mechanical department's inspection. However, a locomotive engineer may have to conduct a cursory inspection and perform a running test of the brake system to satisfy this requirement, if a prior inspection has not been performed.

#### *Section 232.107 Air Source Requirements*

This section contains requirements directed at ensuring that freight brake systems are devoid, to the maximum extent practical, of water and other contaminants which could conceivably deteriorate components of the brake system and, thus, negatively impact the ability of the brake system to function as intended. The general preamble section of this rule provides a detailed discussion as to why FRA proposed many of the items contained in this paragraph. See discussion contained in "Overview of Comments and General FRA Conclusions" portion of the preamble under the heading "Air Source Requirements." Based on the work performed by and information gathered by the RSAC Working Group and based on FRA field experience, FRA continues to believe that requiring locomotives to be equipped with air dryers would provide minimal safety benefits and would impose an enormous and unwarranted cost burden on the railroads. Further, FRA continues to believe that simply requiring that yard air sources be equipped with air dryers may not necessarily effectuate the

desired results unless the air dryers are appropriately placed to sufficiently condition the air source. Many yard air sources are configured such that a single air compressor services several branch lines used to charge train air brake systems and, therefore, multiple air dryers may be required to eliminate the introduction of wet air into the brake system. FRA believes that, as with locomotives, requiring yard air sources to be equipped with air dryers would likely impose a significant and unnecessary cost burden on the railroads.

This section retains the basic requirements regarding yard air sources and cold weather operations that were proposed in the NPRM with minor modification based on the comments submitted in response to the proposal. Paragraph (a) retains the provisions requiring railroads to adopt and comply with a plan to monitor all yard air sources to ensure that the yard air sources operate as intended, are in proper condition, and do not introduce contaminants into the brake system of freight equipment. FRA intends to make clear that the inspections required under this paragraph are to be thorough inspections of the entire yard air source. This inspection would include all compressors, piping, hoses, valves, and any other component or part of the yard air source to ensure it is in proper condition and operates as intended.

Paragraph (a) modifies some of the proposed requirements related to the yard air source monitoring plans. FRA agrees with the comments provided by several labor representatives that the proposed requirements did not establish a frequency with which inspections of yard air sources should be conducted. In proposing the requirement, FRA hoped that various commenters would recommend frequencies for conducting these inspections. This did not occur. FRA agrees that a set frequency needs to be established which will ensure that yard air sources are inspected in a timely manner during various climatic conditions. Therefore, paragraph (a)(2)(i) requires that the monitoring plan developed by a railroad ensure that each yard air source be inspected at least twice each calendar year and that two of the inspections be no less than five months apart. FRA intends for this requirement to result in yard air sources being inspected each year during two different seasonal periods.

Paragraph (a)(2)(ii) clarifies that remedial action under the monitoring plans is required only on those yard air sources that are not operating as intended or that are found introducing contaminants into brake systems. Thus,

the final rule removes the word "potential" from the proposed language as FRA agrees that the proposed language was unclear and may have been over-inclusive. The final rule also eliminates the proposed requirement for railroads to conduct a detailed assessment of the remedial actions taken. FRA agrees with the assertions of AAR that this proposed requirement is unnecessary because railroads will be conducting regular inspections of the yard air sources on which they have conducted repairs or taken other remedial action and will be able to determine if the repair were effective through those inspections. Paragraph (a)(3) retains the other proposed record keeping requirements related to yard air monitoring plans but clarifies that the records can be maintained either electronically or in writing. FRA continues to believe that these records are necessary to ensure that railroads are properly conducting the required inspections and are taking timely and appropriate remedial action when a problem air source is detected.

The final rule does not contain provisions requiring FRA approval of the yard air source monitoring plans prior to their implementation as suggested by some commenters. FRA does not have the personnel or resources to review and approve the plan of each railroad and does not believe such approval is necessary given the specific requirements contained in the final rule and the records that are required to be maintained. Although the final rule does not contain requirements regarding the use of air dryers on either locomotives or yard air sources, FRA advocates the use of air dryers when possible and agrees that they have proven effective in reducing the level of moisture introduced into the brake system. However, FRA believes that a railroad is in the best position to determine where these devices will provide the greatest benefit based on the railroad's operation. FRA notes its disagreement with AAR's contentions regarding both the time and the cost necessary to implement the required yard air source monitoring plans. FRA sees no reason why a railroad would need five years to implement a plan to inspect each of its yard air sources twice a year. These devices are used on a fairly regular, if not daily, basis and should not be that difficult to inspect. Consequently, FRA believes that railroads should easily be able to implement these monitoring plans by the three-year effective date provided in this final rule.

Paragraphs (b) and (d) contain additional measures to minimize the

possibility of moisture being introduced into the trainline. Paragraph (b) of this section reiterates the proposed and current requirement contained at § 232.11(d), which requires that condensation be blown from the pipe or hose from which compressed air is taken prior to connecting the yard air line or motive power to the train. As an additional precaution, paragraph (d) of this section retains the proposed requirement that yard air reservoirs be equipped with an operable automatic drain system, or be manually drained at least once each day that the devices are used or more often when moisture is detected in the system.

Paragraph (c) generally retains the proposed ban on the use of chemicals in a train air brake system. However, FRA agrees with the position asserted by several commenters that the proposed prohibition of all chemicals may have been somewhat overbroad and contrary to FRA's actual intent. In proposing the prohibition FRA intended to eliminate the use of chemicals, such as alcohol, which are known to degrade the rubber of a train's brake system. FRA agrees that there may be chemicals which are currently available or which are in the process of being developed which do not cause the problems associated with the use of alcohol. In fact, FRA believes there are products currently available which do not degrade a brake system's rubber components. FRA believes that several railroads are currently testing or using these chemical alternatives. Therefore, FRA believes that there are alternatives to using alcohol which currently exist or can be developed which would provide railroads the ability to address the rare instances where trainlines become frozen. Consequently, this paragraph slightly modifies the prohibition on the use of chemicals by imposing the prohibition on chemicals that are known to degrade or harm brake system components, such as alcohol.

It should be noted that FRA recently published a final rule mandating the incorporation of two-way EOTs on a variety of freight trains, specifically those operating at speeds of 30 mph or greater or in heavy grade territories. See 62 FR 278. Two-way EOTs provide locomotive engineers with the capability of initiating an emergency brake application that commences at the rear of the train in the event of a blockage or separation in the train's brake pipe that would prevent the pneumatic transmission of the emergency brake application from the front of the train through the rest of the train. These devices consist of a front unit, located in the cab of the

controlling locomotive, and a rear unit, located in the rear of the train and attached to the brake pipe. Radio communication between the front and rear units is continually monitored and confirmed at regular intervals, and the rear unit is only activated when continuity of these radio transmissions is not maintained over a specified time interval. This discussion of two-way EOTs is particularly appropriate within the context of the air source requirements. In the unlikely event that compliance with the requirements contained in this section regarding dry air fails to sufficiently eliminate moisture from the trainline, and a restriction or obstruction in the form of ice develops as the result of freezing of this moisture during cold weather operations, the two-way EOT device becomes a first-order safety device and will initiate an emergency application of the brakes from the rear of train. As such, the vast majority of concerns associated with moisture in the trainline freezing during cold weather operations have been alleviated through the incorporation of this technology in most freight operations.

Paragraph (e) retains the proposed requirement that a railroad adopt and comply with detailed written operating procedures tailored to the equipment and territory of the railroad to promote safe train operations during cold weather situations. In 1990, the NTSB, in response to an accident which occurred in Helena, Montana, recommended that FRA amend the power brake regulations to require additional testing of air brake systems when operating in extreme cold, especially when operated in mountain grade territory. See NTSB Recommendation R-89-081 (February 12, 1990). In response to this recommendation and to various petitions for rulemaking requesting similar action, FRA in the 1994 NPRM proposed various requirements regarding cold weather operations, which included: use of two-way EOTs; prohibition on the use of alcohol in trainlines; air dryers on locomotives; and requirements for railroads to develop procedures for operating during cold weather and in mountain grade territories. As noted previously, a final rule regarding the use of two-way EOTs has been issued and is in effect. This final rule also prohibits the use of certain anti-freeze chemicals, contains other requirements to ensure that dry air is being added to brake systems, and retains the previously proposed requirement that railroads adopt and comply with operating requirements for

cold weather and heavy-grade operations.

FRA recognizes that in the past there has been little support for mandating additional brake system testing during cold weather. FRA agrees that the development and use of welded pipe fittings, wide-lip hose couplings, and ferrule clamps have greatly reduced the effects of cold weather on the air brake system. However, FRA continues to believe that cold weather situations do involve added safety risks and need to be further addressed. FRA believes that requiring the development of written operating procedures will require railroads to go through the thought process necessary to analyze their operations during cold weather conditions in order to determine the inherent safety hazards involved and develop procedures to minimize those hazards. Due to the unique nature of each railroad and the difficulty in developing specific requirements that are applicable to all operations, FRA does not intend to mandate specific operating requirements at this time. However, FRA might consider mandating specific operating requirements that should be included in a railroad's cold weather operating practices if it is found that railroads do not develop sufficient requirements to address safe cold weather operations.

FRA recognizes that some railroads have already developed certain cold weather operating procedures which might be useful as models on other similarly situated railroads. For example, BNSF has unilaterally instituted a cold weather operating plan for certain trains at specific locations in Montana. This plan requires trains with greater than 100 tons per operative brake to be inspected or operated in a certain manner when temperatures fall below zero degrees. Part of the plan requires that after the performance of a 1,000-mile or initial terminal brake test on such trains, the brakes be reset and held for 30 minutes after which time the train is to be reinspected to ensure that 100 percent of the brakes remained applied. Brakes found not to have remained applied must be set out of the train or repaired. FRA believes that procedures such as these could greatly enhance the safety of the trains operated in cold weather conditions. FRA recognizes that there may be other types of operating or inspection criteria that could be implemented in extreme cold weather instead of, or in addition to, that noted above; such as, limits on the length or tonnage of such trains, limits on the use of yard air sources, or other enhanced inspection criteria. At this time, FRA continues to believe that

railroads are in the best position to determine what procedures are best suited to their operations.

#### *Section 232.109 Dynamic Brake Requirements*

This section contains the operating requirements for trains equipped with dynamic brakes. Most, if not all, of the railroads participating in and commenting on this rulemaking have asserted that they do not consider dynamic brakes to be a safety device. However, these same commenters admit that they promote and encourage the use of dynamic brakes for purposes of fuel efficiency and to avoid wear to brake components. Due to this encouragement, dynamic brakes are relied on to control train speed and to provide assistance in controlling trains on heavy grades. Contrary to continued comments of several labor representatives, FRA does not feel that locomotives should be required to be equipped with dynamic brakes. FRA believes that the decision to equip a locomotive with dynamic brakes is mainly an economic one, best determined by each individual railroad. However, in order to prevent accidents and injuries that may result from an over-reliance on the dynamic brake, which may fail at any time, FRA believes that if the devices are available, engineers should be informed on their safe and proper use and be provided with information regarding the amount of dynamic braking power actually available on their respective trains. FRA continues to believe that by providing an engineer with as much information as possible on the status of the dynamic brakes on a train, a railroad better enables that engineer to operate the train in the safest and most efficient manner.

Paragraph (a) generally retains the proposed requirement that a locomotive engineer be informed of the operational status of the dynamic brakes on the locomotives the engineer will be required to operate. This paragraph makes clear that the information is to be provided to the locomotive engineer at a train's initial terminal and at other locations where a locomotive engineer first begins operation of a train. This paragraph slightly modifies the proposed method for providing this information to the locomotive engineer. The NPRM proposed that the locomotive engineer be provided the required information in writing. The intent of the proposed requirement to notify the locomotive engineer in writing as to the operational status of the dynamic brakes was to ensure that the engineer had timely information on

the condition of the locomotives so he or she could operate the train in the safest possible manner based upon that information. Thus, FRA tends to agree with the comments of several railroads and their representatives that the manner in which the information is provided to the engineer should not be a major concern provided the information is accurate and up-to-date. Therefore, this paragraph allows railroads to provide a locomotive engineer with the required information by any means they deem appropriate. However, this paragraph also makes clear that a written or electronic record of the information provided shall be maintained in the cab of the controlling locomotive. This will ensure that relief or other oncoming engineer will have the information provided to the previous operator of the train.

This paragraph also clarifies that the information is to be provided to the locomotive engineer at the train's initial terminal and at other locations where an engineer "first begins operation" of the train rather than where the engineer "takes charge of the train." This clarification is in response to comments provided by certain labor representatives to prevent possible misinterpretation or abuse of the requirement since most railroads consider the conductor to be in charge of a train.

Paragraph (b) retains the proposed requirement to repair a locomotive with inoperative dynamic brakes within 30 days of its being found inoperative or at the locomotive's next periodic inspection, whichever occurs first. There are currently no requirements governing the maintenance and repair of dynamic brakes. Experience has shown that, since railroads do not consider dynamic brakes to be a critical safety item, repairs are typically effectuated when it is convenient and economical for the railroad, with little regard for timeliness. FRA believes that, as railroads have become increasingly dependent on the use of dynamic brakes as an integral part of their published safe train handling procedures, it is a reasonable expectation on behalf of locomotive engineers to have operable dynamic brakes on those locomotive units which are so equipped. Due to the industry's reliance on these braking systems, as noted in the discussion above, FRA continues to believe they should be repaired as soon as possible after being found inoperative. FRA agrees that there must be an appropriate balance between the operational considerations important to the locomotive engineer and the logistical and repair considerations that will be

imposed on the railroads. FRA continues to believe that 30 days provides a railroad with sufficient time to get a locomotive to a location where the dynamic brakes can be repaired and allows for the reallocation of motive power when necessary so as to cause minimal disruption to a railroad's operation. Although certain commenters requested that the period allowed for repair be reduced to 15 days or less, FRA believes such a reduction is unwise as it might jeopardize a railroad's access to available motive power and could cause delay in the movement of freight, consequences that may create safety hazards themselves.

This paragraph also eliminates the use of the term "ineffective dynamic brake" and replaces it with the term "inoperative dynamic brake." The term "inoperative dynamic brake" is defined in § 232.5 of the final rule to mean any dynamic brake which no longer provides its designed retarding force on the train, for whatever reason. FRA agrees with the comment of the AAR that the use and meaning of the term "ineffective dynamic brake" in the proposal was unclear and had the potential of creating misunderstandings. Consequently, for clarity this section uses only the term "inoperative dynamic brake" to describe a defective dynamic brake.

Paragraph (c) retains the proposed requirements related to the tagging of a locomotive found with inoperative dynamic brakes. FRA believes that the tags required by this paragraph are necessary to ensure the prompt and timely repair of locomotives found with defective dynamic brakes and also provide locomotive engineers and a railroad's ground forces with specific knowledge of the presence of such a locomotive. Contrary to the comments of some parties, FRA does not believe that the tagging provisions contained in this paragraph would require the development of new tags. This paragraph would allow the use of any type of tag provided it is placed in a conspicuous location on the cab of the locomotive and contains the required information.

Paragraph (d) contains a requirement that an electronic or written record of repairs made to a locomotive's dynamic brakes be maintained and retained for a period of 92 days. Although this requirement was not proposed in the NPRM, FRA believes these records fall within the scope of the notice and are necessary to ensure that repairs are conducted on a locomotive's dynamic brakes in a timely fashion. FRA also believes that such a record will provide a railroad with information regarding

the operation of the dynamic brakes and will potentially permit railroads to identify a repeated problem with a locomotive's dynamic brakes to prevent recurrences of the problem and thus, increase the utilization of a locomotive's dynamic brakes.

The final rule continues to acknowledge that some railroads, primarily short lines, may own locomotives that are equipped with dynamic brakes but due to the physical terrain over which the railroad operates or the operating assignments of the particular locomotive, the railroad rarely, if ever, has the need to employ the dynamic braking capabilities of the individual locomotive. In these instances, the maintenance requirements discussed above become unnecessarily burdensome. Therefore, FRA continues to believe that relief is warranted in these situations provided a specified set of parameters is developed and adhered to that prevents direct and intentional circumvention of the proposed repair requirements.

Therefore, paragraph (e) retains the proposed provision permitting a railroad to declare a locomotive's dynamic brakes "deactivated" if the following requirements are met: (i) The locomotive is clearly marked with the words "dynamic brake deactivated" in a conspicuous location in the cab of the locomotive; and (ii) the railroad has taken appropriate action to ensure that the deactivated locomotive is incapable of utilizing dynamic braking effort to retard or control train speed. It should be noted that the final rule eliminates the requirement to stencil the outside of a locomotive declared to have deactivated dynamic brakes. FRA agrees with the comments submitted by the AAR and other railroad representatives that defacing the exterior of the locomotive is unnecessary and would do little to inform the locomotive engineer of the deactivation of the dynamic brake. FRA believes that the requirements to notify the locomotive engineer of the operational status of the locomotives and to have the cab of the locomotive clearly marked that the locomotive's dynamic brakes are deactivated provide sufficient notice to the locomotive engineer as to the status of that locomotive.

This paragraph does not prescribe the specific manner in which a locomotive is to be deactivated, so long as the unit is not physically capable of employing its dynamic brakes to aid in train handling. Although FRA does not envision a significant number of instances where a locomotive which has been declared "deactivated" would need to be "reactivated," FRA does

recognize that some railroads may need to reactivate the dynamic brakes in some circumstances, such as changes in a locomotive's operating environment or situations where a locomotive with previously "deactivated" dynamic brakes is purchased by another railroad. However, FRA intends to interpret the provision for "deactivating" a locomotive's dynamic brakes rather literally to minimize contentions that railroads are merely playing a cat and mouse game with the required maintenance interval to avoid repairing the units. Furthermore, FRA would expect the dynamic brakes on a locomotive to be fully functional at the time the locomotive is considered reactivated.

Paragraph (f) contains specific requirements related to the use of a locomotive with inoperative, deactivated, or no dynamic brakes as a controlling locomotive. These requirements are based on FRA's review of the comments submitted in response to FRA's request regarding the positioning of such locomotives contained in the NPRM. See 63 FR 48314. FRA tends to agree that there are no technical reasons why a locomotive with inoperative dynamic brakes cannot function as the controlling locomotive provided it can control the dynamic brakes on trailing units in the locomotive consist. However, FRA also agrees that a locomotive engineer loses the physical sensation of the operation of the dynamic brakes when the unit the engineer is riding loses dynamic brake capability because the physical sensation of operating dynamic brakes provides the engineer with at least some assurance that the dynamic brakes on some of the units in the consist are operating. Thus, this paragraph makes clear that locomotives with inoperative, deactivated, or no dynamic brakes have the capability of controlling the dynamic brakes on trailing units when operating as the controlling locomotive, and that such locomotives also have the capability of displaying to the locomotive engineer the deceleration rate of the train or the total train dynamic brake retarding force. FRA believes this requirement will ensure that locomotive engineers have at least some information as to the operation of the dynamic brakes in the locomotive consist they are controlling. FRA intends that the information required by this provision be provided by a device known as an "accelerometer", "predictor", or a similar type of device; or by a dynamic brake indicator capable of providing total train dynamic brake retarding force to the locomotive

engineer. An "accelerometer" or "predictor" is a device currently used in the industry that indicates the predicted speed in miles per hour of the locomotive 60 seconds from the present, based on the computed acceleration or deceleration rate. This would provide the engineer with an indication of the retarding performance of the dynamic brakes and the train.

Paragraph (g) contains provisions requiring new locomotives to be equipped with some sort of dynamic brake indicator. In the NPRM, FRA sought information and comments regarding the feasibility of dynamic brake indicators which continually monitor the operation of dynamic brakes in a train consist. See 63 FR 48334. The NTSB noted that the NPRM failed to address its recommendation resulting from its investigation of the January 12, 1997, freight train derailment near Kelso, California, that all locomotives equipped with dynamic brakes be equipped with a device in the cab of the controlling locomotive to indicate real-time condition of the dynamic brakes on each trailing unit. See NTSB Recommendation R-98-6. Based on a review of the comments and information provided, FRA continues to believe that the technology does not currently exist to economically equip existing locomotives with dynamic brake indicators. However, FRA does believe that the technology exists or is sufficiently developed to provide new locomotives with the ability to test the electrical integrity of the dynamic brakes at rest and to display the total train dynamic brake retarding force at various speed increments in the cab of the controlling locomotive. Consequently, this paragraph requires new locomotives to be equipped with such indicators. FRA recognizes that the industry will require a little time to incorporate the existing and developing technology into new locomotives. Therefore, the requirements contained in this paragraph will apply only to locomotives ordered one and one-half years after the issuance of this final rule and to locomotives placed in service for the first time three years after the effective date of the final rule.

Paragraph (h) contains requirements for equipping rebuilt locomotives with devices to provide locomotive engineers with additional information on the operation of dynamic brakes on other locomotives in the train consist. This paragraph recognizes that not all locomotives being rebuilt are designed, or have the capability of being redesigned to have the capability to display the total train dynamic brake retarding force in the cab of the

controlling locomotive. Thus, this paragraph allows rebuilt locomotives to be designed to display the train deceleration rate (i.e., to be equipped with an accelerometer, predictor, or similar device as described above) in lieu of being equipped with the dynamic brake indicator required on new locomotives. FRA believes that the information provided by these indicators is extremely useful to an engineer, will provide the engineer with ready access to real-time information on the operation of the dynamic brakes in a locomotive consist, and will permit the engineer to control and operate trains in the safest manner possible.

Paragraph (i) acknowledges that the information provided to a locomotive engineer by a dynamic brake indicator would satisfy the need to provide the locomotive engineer with information regarding the operational status of the dynamic brakes when the engineer first begins operation of a train. As the indicators would provide real-time information to the engineer on the operation of the dynamic brakes in the train consist, a separate set of information received by the engineer when beginning operation would be unnecessary. Therefore, this paragraph carves out an exception to the requirement to inform locomotive engineers of the status of the dynamic brakes for situations when all of the locomotives in the lead consist are equipped with dynamic brake indicators of the type required for new locomotives. FRA believes that this exception makes sense from a practical perspective and also provides some incentive for railroads to equip existing equipment with such indicators where possible when the technology for doing so becomes economically feasible. It should be noted that there is no requirement that the dynamic brake status of distributed power units be provided in order to eliminate the need to provide dynamic brake information to the engineer. FRA agrees that the technology for transmitting that information to the engineer is not currently available in a cost effective and reliable manner.

Paragraphs (j) and (k) retain the proposed provisions requiring railroads to adopt and comply with written operating rules governing the use of dynamic brakes and to incorporate training on those operating rules into the locomotive engineer certification program pursuant to 49 CFR part 240. Contrary to the assertions of some commenters FRA does not believe these requirements are unclear. FRA intends for each railroad to develop appropriate operating rules regarding train handling

procedures when utilizing dynamic brakes that cover the equipment and territory operated by the railroad. Many railroads already have these procedures in place and already provide training to their employees which adequately cover the requirements. FRA continues to believe that training on proper train handling procedures is essential to ensuring that locomotive engineers can properly handle their trains with or without dynamic brakes and in the event that these brake systems fail while the train is being operated. FRA also disagrees that it must specify the knowledge, skill, and ability criteria that a railroad must adopt into its training program. FRA believes that each railroad is in the best position to determine what these criteria should be and what training is necessary to provide that knowledge, skill, and ability to its employees.

FRA continues to believe that the establishment of these comprehensive operating rules and their incorporation into a railroad's training plans is the most effective means by which to minimize the possibility of future accidents caused by excessive reliance on dynamic brakes by a train crew as a method of controlling the speed of a train in its descent through a difficult grade, as was the case in the San Bernardino incident. FRA views as unfortunate the number of existing train handling and power brake instructions issued by freight railroads that emphasize the use of dynamic brakes but do not include prominent warnings that such systems may not be relied upon to provide the margin of safety necessary to stop short of obstructions and control points or to avoid overspeed conditions. FRA believes that such instructions, while not misleading to seasoned locomotive engineers, could lead to an excessive reliance on these systems. Given the ever-increasing weight and length of freight trains, and the severe grades that they are often required to negotiate en route, the need for locomotive engineers who are thoroughly trained and knowledgeable in all aspects of train handling is paramount for continued safety in the rail industry.

Paragraph (j)(2) requires that the operating rules developed by railroads under this section include a "miles-per-hour-overspeed" requirement that requires trains to be immediately stopped if they exceed the maximum authorized speed by more than 5 mph when descending grades of one percent or greater. The NTSB recommended that FRA adopt such a requirement as a result of its investigation of the freight train derailment near Kelso, California

noted above. *See* NTSB Recommendation R-98-4. FRA agrees with NTSB's recommendation and also agrees with the comments provided by both the NTSB and the CAPUC that this requirement accomplishes a critical safety function and reduces the potential for runaways because it establishes a clear rule for stopping a train and removes any discretion from the operator to continue operation of a train. This paragraph makes clear that the five-mph limitation is a good base limitation which should be reduced by a railroad if it so desires or if a reduction is indicated by validated research. The five-mph limitation may only be increased with FRA approval. FRA notes that the operating rules of virtually every Class I railroad already include a five-mph-overspeed provision similar to that contained in this paragraph. Consequently, FRA's inclusion of the requirement in this final rule should impose little or no burden on the operations of most railroads.

#### *Section 232.111 Train Information Handling*

This section retains the proposed requirements regarding the handling of train information, with slight modification in response to the comments submitted by interested parties. The purpose of the train-information handling requirements contained in this section is to ensure that a train crew is provided accurate information on the condition of a train's brake system and other factors that affect the performance of a train's brake system when the crew assumes responsibility for a train. This section contains a list of the specific information railroads are to furnish train crew members about the train and the train's brake system at the time they take charge of the train. FRA continues to believe that train crews need this information in order to avoid potentially dangerous train handling situations and to be able to comply with various Federal safety standards. Many railroads already provide their train crews with most of the information required in this section or have a process set up that can transmit such information; thus, the impact of these requirements should be relatively minor.

Paragraph (a) has been slightly modified to clarify that the information required to be provided in this section may be provided by any means determined appropriate by the railroad, provided, that a record of the information is maintained in the cab of the controlling locomotive. This requirement does not constitute a

change from what was proposed in the NPRM but is merely a clarification to resolve an apparent misunderstanding of some parties. In the NPRM, FRA noted that it intended to leave the method in which the required information would be conveyed to train crews to the discretion of each railroad. FRA believed that each individual railroad is in the best position to determine the method in which to dispense the required information based on the individual characteristics of its operations. However, FRA noted that the means for conveying the required information would have to be part of the written operating requirements, and railroads would be required to follow their own requirements.

Paragraphs (b)(1) and (b)(2) have also been slightly modified, for purpose of clarity, from what was proposed in the NPRM. Paragraph (b)(1) clarifies that train crews are to be provided the required information when "taking charge of a train" rather than when "coming on duty" as was proposed. FRA agrees with the comments of the AAR that the modified language better clarifies when the required information is to be provided. Paragraph (b)(2) has been modified to clarify that the weight and length information to be provided should be based on the best information available to the railroad. FRA agrees with the comments of the AAR and several railroads that it is impossible to provide the exact weight of each car in a train because the facilities to weigh each car do not exist. FRA also agrees that it would be cost prohibitive and unrealistic to require that each car be weighed prior to being moved in a train. Consequently, the final rule makes clear that the weight of the train can be estimated based on the best information available to the railroad. It should be noted that FRA has eliminated the proposed requirement that train crews be provided a record of train configuration changes since performance of the last Class I brake test. FRA agrees that such information is not necessary based on the other information that is required to be provided and has the potential of creating information overload for the train crews.

#### **Subpart C—Inspection and Testing Requirements**

##### *Section 232.201 Scope*

This section contains the general statement regarding the scope of this subpart, indicating that it contains the inspection and testing requirements for brake systems used in freight and other non-passenger trains. This section also

indicates that this subpart contains the general training requirements for railroad and contract personnel who perform the inspections and tests required by this part.

#### *Section 232.203 Training Requirements*

This section contains the general training requirements for railroad employees and contractor employees that are used to perform the inspections required by this part. (See "Overview of Comments and General FRA Conclusions" portion of the preamble under the heading "V. Training and Qualifications of Personnel" for a detailed discussion pertaining to the provisions contained in this section.) This section retains the basic structure and concepts regarding the training and qualification of individuals performing inspections and tests required by this part that were proposed in the NPRM. The training requirements contained in this final rule have been slightly revised from those proposed in the NPRM in order to clarify FRA's intent, to recognize existing training, and to reduce some of the burden that may have been inadvertently created by the proposed requirements.

Paragraph (a) requires that each railroad and each contractor adopt and comply with a training, qualification, and designation program for railroad employees and contractor employees who perform air brake system tests, inspections and maintenance. This paragraph modifies the proposed provision that would have required a railroad to provide training to the personnel of a contractor whom the railroad uses to perform the various tasks required by the rule. This paragraph makes clear that the contractor is responsible for providing appropriate training to its employees and maintaining the required records and information. FRA agrees with the comments submitted on behalf of numerous railroads that asserted that railroads should not bear the burden of training the employees of a contractor. However, FRA notes that this change does not relieve the railroad from potential civil penalties for, e.g., failure to perform a proper Class I brake test, if the employees of a contractor are found not to be qualified to perform the task for which they are assigned responsibility. Both the railroad and the contractor would remain liable for potential civil penalties if the employees used to perform a particular task were not trained and qualified in accordance with the training requirements contained in this final rule.

For purposes of this section, a "contractor" is defined as a person under contract with a railroad or a car owner or an employee of a person under contract with a railroad or a car owner. FRA intends for the training and qualification requirements to apply not only to railroad personnel but also to contract personnel that are responsible for performing brake system inspections, maintenance, or tests required by this part. FRA believes that railroads and contractors are in the best position to determine the precise method of training that is required for the personnel they use to conduct required brake system inspections, tests, and maintenance. Although FRA provides railroads and contractors with broad discretion to develop training programs specifically tailored to their operations and personnel, FRA will expect railroads and contractors to fully comply with the training and qualification plans they adopt. A critical component of this training will be making employees aware of specific Federal requirements that govern their work. Currently, many railroad training programs fail to distinguish Federal requirements from company policy.

Paragraph (b) contains general requirements or elements which must be part of any training and qualification plan adopted by a railroad or contractor. FRA believes that the elements contained in this section are specific enough to ensure high quality training and broad enough to permit a railroad or contractor to adopt a training plan that is best suited to its particular operation. This paragraph retains the proposed requirement that the plan identify the tasks related to the inspection, testing, and maintenance of the brake system required to be performed by the railroad or contractor and identify the skills and knowledge necessary to perform each task. FRA believes that most railroads already have a training plan and would merely need to revise it to reflect changes made to existing requirements by this final rule. The final rule eliminates the proposed requirement to develop written procedures for performing each task identified. Although FRA believes that each railroad or contractor should and will develop such procedures, FRA does not believe it is necessary to require their development as FRA believes they will either be developed in the required training curricula or are sufficiently detailed in the regulation itself.

This paragraph also clarifies that the required training is intended to provide employees with the skills and knowledge necessary to perform the

tasks required by this final rule. FRA does not believe it is necessary to train an employee on every different type of equipment that a railroad operates or on each and every task an employee will be required to perform. FRA's intent when issuing the NPRM was to ensure that the training received by an employee provides that individual with the knowledge and skills needed to perform the tasks he or she is assigned on the various types of brake systems on the equipment the railroad operates. Therefore, this paragraph clarifies this intent by specifically stating that the training curriculum, the examinations, and the "hands-on" capability should address the skills and knowledge needed to perform the various required tasks rather than focusing strictly on the tasks themselves or on the specific types of equipment operated by the railroad. However, FRA does intend for the training developed by the railroad or contractor to address the various types of brake systems the employee will be required to inspect, test, or maintain. For example, if an employee were trained on how to perform a Class I brake test and demonstrated hands-on capability to perform that task, FRA would not expect the employee to demonstrate hands-on capability to perform a Class IA or Class II brake test since the components of a Class I brake test cover these other inspections. However, FRA would expect the employee to receive classroom training on when these other inspections are required and the tasks that are involved in each.

This paragraph also clarifies that the training that an employee is required to receive need only address the specific skills and knowledge related to the tasks that the person will be required to perform under this part. Thus, a railroad or contractor may tailor its training programs to the needs of each of its employees based on the tasks that each of its employees will be required to perform. FRA tends to agree with several commenters that there is no reason for an individual who performs strictly brake inspections and tests to be as highly trained as a carman since carmen perform many other duties related to the maintenance and repair of equipment in addition to brake inspections.

This paragraph also clarifies that previous training and testing received by an employee may be considered by the railroad. FRA did not intend to require the complete retraining of every employee performing a task required in this final rule. When proposing the training requirements, FRA intended for railroads to incorporate existing training

regimens and curricula into the proposed training programs. In order to clarify this intent, this paragraph permits railroads and contractors to incorporate an already existing training program, such as an apprenticeship program, and contains a specific provision which permits railroads and contractors to consider previous training and testing received by an employee when determining whether an employee is qualified to perform a particular task. Thus, railroads and contractors would most likely not need to provide much additional training, except training specifically addressing the new requirements contained in this part and possibly refresher training, to its carmen forces that have completed an apprentice program for their craft. However, the final rule also makes clear that any previous training or testing considered by a railroad or contractor must be documented as required in the final rule. Thus, previous training or testing which has not been properly documented cannot be considered. The final rule also makes clear that employees must be trained on the specific regulatory requirements contained in this final rule related to the tasks that the employee will be required to perform. Therefore, all employees will require at least some training which covers the specific requirements detailed in this final rule.

This paragraph retains the proposed requirements that any program developed must include experiential or "hands-on" training as well as classroom instruction. FRA believes that classroom training by itself is not sufficient to ensure that an individual has retained or grasped the concepts and duties explained in a classroom setting. In order to adequately ensure that an individual actually understands the training provided in the classroom, some sort of "hands-on" capability must be demonstrated. FRA believes that the "hands-on" portion of the training program would be an ideal place for a railroad to fully involve its labor force in the training process. Appropriately trained and skilled employees would be perfectly suited to provide much of the "hands-on" training envisioned by FRA. Consequently, FRA strongly suggests that railroads work in partnership with their employees to develop a training program which utilizes the knowledge, skills, and experience of the employees to the greatest extent possible.

This paragraph also retains, with modification for clarity, the proposed requirement that employees pass either a written or oral examination and demonstrate "hands-on" capability. This paragraph clarifies that the tests

and demonstration of "hands-on" capability cover the skills and knowledge the employee will need to possess in order to perform the tasks required by this part that the employee will be responsible for performing rather than focusing strictly on the tasks themselves or on the specific types of equipment operated by the railroad. However, FRA does intend for the testing and "hands-on" demonstration to cover the various types of brake systems the employee will be required to inspect, test, or maintain. FRA continues to believe that in order for a person to be adequately trained to perform a task, the individual must not only possess the knowledge of what is required to be performed but also must possess the capability of applying that knowledge.

This paragraph also retains the proposed requirement regarding the performance of periodic refresher training and testing. The final rule retains the requirement that refresher training be provided at least once every three years and that it include both classroom and experiential "hands-on" training and testing. FRA continues to believe that periodic refresher training is essential to ensuring the continued ability of an employee to perform a particular task. FRA does not intend for such training to be as lengthy or as formal as the initial training originally provided, but believes that the training should reemphasize key elements of various tasks and focus on items or tasks that have been identified as being problematic or of poor quality by the railroad, contractor, or its employees through the periodic assessment of the training program. This paragraph makes clear that a railroad or contractor may use efficiency testing to meet the hands-on portion of the required refresher training provided such testing is properly documented and covers the necessary tasks to ensure retention of the knowledge and skill required to perform the employee's duties required by this part. FRA agrees that such testing provides the necessary assurances that the individual continues to have the knowledge and skills necessary to perform the task for which the employee is being tested.

This paragraph contains a provision that was not specifically included in the NPRM but which was intended by FRA to be covered by the established training programs. This paragraph requires that new brake systems be added to training programs prior to their introduction into revenue service. Several labor representatives recommended that this provision be explicitly added to the training provisions, and FRA believes

this requirement is only logical and makes sense. FRA believes that, prior to the introduction of any new brake system, the employees responsible for inspecting and maintaining the equipment need to be specifically trained on the systems in order to adequately perform their required tasks.

This paragraph also retains the proposed requirement that supervisors exercise oversight to ensure that all identified tasks are performed in accordance with the railroad's procedures and the specific Federal regulatory requirements contained in this part. Although the final rule also does not specifically address the training that must be provided to supervisors as suggested by some commenters, FRA believes that supervisors are sufficiently covered by the requirements contained in this section. FRA believes that in order for a supervisor to properly exercise oversight of an employee's work, the supervisor must be trained and qualified to perform the tasks for which they have oversight responsibilities.

Paragraph (c) requires each railroad that operates trains required to be equipped with two-way EOTs and each contractor that maintains such devices adopt and comply with a training program which specifically addresses the testing, operation, and maintenance of the devices. The final rule requiring the use of two-way EOTs became effective on July 1, 1997. Since that time, FRA has discovered numerous operating and mechanical employees who do not fully understand when the devices are required or how the inspection and testing of the devices are to be accomplished. Furthermore, FRA believes that it is vital for those employees responsible for the use of the devices (e.g. engineers and conductors) to be intimately familiar with the use and operation of the devices to ensure that the full safety potential of the devices is utilized and available. Consequently, FRA believes that adequate training must be provided to those employees responsible for the inspection, testing, operation and use of two-way EOTs.

Paragraph (d) requires railroads that operate trains under conditions that require their employees to set retaining valves to develop training programs which specifically address the use of retainers and provide such training to those employees responsible for using or setting retainers. This provision has been added in response to an NTSB recommendation which FRA supports. See NTSB Recommendation R-98-7. The NTSB specifically suggested that an explicit requirement to provide this

training be contained in the final rule. The NTSB had previously recommended such a requirement in early 1998 based on its investigation of the 1997 derailment of a freight train near Kelso, California. Many railroads are currently providing such training based on that recommendation and FRA believes that a specific requirement to provide such training will ensure that all railroads that require their employees to set retainers adequately train their employees responsible for performing the task on the use of retainers.

Paragraph (e) retains the record keeping requirements proposed in the NPRM with slight modification for consistency with the changes noted above regarding the application of the skills and knowledge necessary to perform a particular task. FRA continues to believe that the record keeping and designation requirements contained in this final rule are the cornerstone of the training requirements. Contrary to the views of some commenters, FRA believes that something more than mere lists of qualified employees is needed. Because the rule allows each railroad and contractor the flexibility to develop a training program that best fits its operation and does not impose specific curriculum or experience requirements, FRA continues to believe it is vital for railroads and contractors to maintain detailed records on the training they do provide. Such documentation will allow FRA to judge the effectiveness of the training provided and will provide FRA with the ability to independently assess whether the training provided to a specific individual adequately addresses the skills and knowledge required to perform the tasks that the person is deemed qualified to perform. Moreover, requiring these records will deter railroads and contractors from circumventing the training requirements and discourage them from attempting to utilize insufficiently trained personnel to perform the inspections and tests required by this rule.

This paragraph makes clear that the required records may be maintained either electronically or on paper. Many railroads currently maintain their training records in an electronic format, and FRA sees no reason not to permit such a practice if the information can be provided to FRA in a timely manner upon request. The proposed provision requiring the railroad's chief mechanical or chief operating officer to sign a statement regarding each employee's qualifications has been modified in the final rule to merely require identification of the person or persons

making the determination that the employee has completed the necessary training. This modification will permit the information to be maintained electronically and will still provide the accountability which FRA intended by the provision in the NPRM. FRA believes it is absolutely essential that those individuals making the determinations regarding an employee's qualification be identified in order to ensure the integrity of the training programs developed and to prevent potential abuses by a railroad or contractor.

FRA also objects to the portrayal by some commenters that the requirement to maintain training records is overly burdensome. Virtually all of the items required to be recorded are currently maintained by most railroads in some fashion or another. Contrary to the concerns raised by some commenters, the rule does not require that the contents of each training program be maintained in each employee's file. Railroads are free to develop whatever type of cross-referencing system they desire, provided the contents of the training program are maintained in some fashion and can be readily retrieved. Furthermore, railroads currently maintain lists of individuals they deem to be qualified persons, and the companies inform those individuals as to their status to perform particular tasks. FRA believes this is a good practice and is necessary to ensure that individual employees do not attempt to perform, or are not asked to perform, tasks for which they have not been trained.

Paragraph (e) requires that each railroad or contractor adopt and comply with a plan to periodically assess the effectiveness of its training program. This paragraph modifies the proposed requirement that railroads develop an internal audit process to evaluate the effectiveness of their training. Although FRA agrees that a formal audit process may not be necessary, FRA continues to believe that railroads and contractors should periodically assess the effectiveness of their training programs. However, rather than require a formal internal audit, FRA believes that periodic assessments may be conducted through a number of different means and each railroad or contractor may have a need to conduct the assessment in a different manner. This paragraph requires that a railroad or contractor institute a plan to periodically assess its training program and, as suggested by some commenters, the paragraph permits the use of efficiency tests or periodic review of employee performance as methods for conducting

such review. FRA agrees that many railroads, due to their small size, are capable of assessing the quality of the training their employees receive by conducting periodic supervisory spot checks or efficiency tests of their employees' performance. However, FRA continues to believe that on larger railroads the periodic assessment of a training program should involve all segments of the workforce involved in the training. FRA believes it is vital that labor be intrinsically involved in the assessment process, from beginning to end. For example, evaluation of training techniques might best be approached through a "team" method, where several observers, including labor representatives, periodically evaluate course or "hands-on" training content and presentation.

#### *Section 232.205 Class I Brake Test-Initial Terminal Inspection*

This section describes the circumstances that would mandate the performance of a Class I brake test and outlines the tasks that must be performed when performing this inspection. Most of the provisions contained in this section are currently contained in § 232.12(a) and (c)-(h) or were proposed in the 1998 NPRM in order to clarify existing requirements, to eliminate potential abuses, and to standardize certain provisions. Basically a Class I brake test is intended to be the functional equivalent to what is currently referred to as an "initial terminal brake inspection."

Paragraph (a) identifies those trains that are required to receive a Class I brake test prior to movement from a location. The provisions contained in this paragraph are virtually identical to those proposed in the NPRM, with slight modification for clarity. Paragraph (a)(1) requires that a train receive a Class I brake test at the location where it is originally assembled. It should be noted that the final rule eliminates the term "point of origin" proposed in the NPRM. FRA agrees that the proposed definition of this term was duplicative of the term "initial terminal" and merely created potential misunderstandings. Moreover, FRA agrees that the problems attempted to be addressed by the use of this term are sufficiently addressed by the various inspections required in this final rule when cars are added to a train.

Paragraph (a)(2) requires the performance of a Class I brake test when the train consist is changed other than by adding or removing a solid block of cars. Currently, there appears to be some confusion over what constitutes a "solid block of cars." In order to clarify the

issue, FRA proposed a definition of "solid block of cars" in the NPRM. In response to numerous comments regarding the proposed definition and to further clarify the issue, FRA has modified the definition in this final rule and referenced that definition in this paragraph. Although FRA believes that the definition it proposed is consistent with current interpretations and enforcement of the requirement, FRA agrees with some of the commenters that the proposed definition may have been too narrow and did not directly address FRA's primary concern, the block of cars itself. FRA's primary concern is the condition of the block of cars being added to the train, especially when the block of cars is made up of cars from more than one train. Thus, the final rule will permit a solid block of cars to be added to a train without triggering a requirement to perform a Class I brake test on the entire train. However, depending on the make-up of that block of cars, certain inspections will have to be performed on that block of cars at the location where it is added to the train.

FRA believes that limits have to be placed on the number of blocks of cars being added to a train in order to ensure that cars are being inspected in a timely manner and in accordance with the intent of the regulations. Some commenters suggest that a block of cars should be permitted to be added to a train with no inspection other than a continuity test regardless of the number of different trains the cars making up the block came from provided all the cars received a Class I brake test at their point of origin. Other commenters suggest that any number of blocks of cars should be permitted to be added to a train at a single location. FRA believes that to accept either of these positions would be tantamount to eliminating initial terminal and intermediate inspections and would drastically reduce the safety of freight trains being operated across the country. In FRA's view, both of the positions noted above are merely means to circumvent inspections and are akin to a practice known as "block swapping" in the mechanical inspection context, a practice that FRA does not permit. In FRA's opinion, the authority to add multiple blocks of cars to a train at one location or add a single block of cars to a train that is composed of cars from numerous different trains without inspecting the cars in those blocks, would essentially allow railroads to assemble new trains without performing any direct inspection of any of the cars in the train. Furthermore, if cars are

permitted to be moved in and out of a train at will, determining when and where a Class IA brake test must be performed on the train will be impossible.

This paragraph requires the performance of a Class I brake test at locations where more than one "solid block of cars" is added to or removed from a train. It should be noted that the final rule permits both the addition and the removal of a "solid block of cars" at a location without requiring the performance of a Class I brake test on the entire train. Although this practice is not permitted under the existing regulations, FRA believes that the inspection requirements contained in this final rule ensure the safety of cars being added and removed in this fashion. This paragraph also contains an additional caveat that will permit the removal of defective equipment at locations where other cars are added or removed without triggering the requirement to perform a Class I brake test on the entire train. FRA currently permits this practice, and it is consistent with the requirements aimed at having defective equipment repaired as quickly as possible.

Paragraph (a)(3) incorporates FRA's longstanding administrative interpretation which permits trains to remain disconnected from a source of compressed air ("off air") for a short length of time without having to be retested. Currently, FRA permits trains to remain "off air" only for a period of approximately two hours before an initial terminal brake inspection must be performed. This paragraph retains the proposed extension of the permissible time "off air" to four hours. A detailed discussion regarding FRA's retention of the proposed extension of the permissible time cars may be left "off-air" is contained in the preceding "Overview of Comments and General FRA Conclusions" portion of the preamble under the heading "II. C. Charging of Air Brake System."

Paragraph (a)(4) retains the proposed requirement that unit or cycle trains receive a Class I brake test every 3,000 miles. The final rule has been slightly modified from the provision contained in the NPRM to clarify that this requirement applies to unit or cycle trains. FRA has also added a definition of "unit train" and "cycle train" to the final rule in order to clarify the applicability of the requirement. Historically, these trains operate for extended periods of time with only a series of brake inspections similar to Class IA brake inspections. FRA believes that the proposed 3,000-mile limitation is appropriate as it represents

the approximate distance that a train would cover when traveling from coast to coast. In addition, the 3,000-mile requirement is consistent with the interval for performing Class IA brake tests and would equate to every third inspection on these trains being a Class I brake test rather than a Class IA brake test. Furthermore, AAR does not seek a moderate extension of a couple hundred miles so a few trains could complete their cycle, but seeks to extend the distance to more than 4,500 miles in many instances. FRA is not willing to modify the proposed requirement to that extent and believes that a 3,000-mile interval for these types of trains provides sufficient flexibility to the railroads to perform periodic Class I brake tests on these train in a cost-effective manner.

Paragraph (a)(5) retains the proposed provisions for when trains received in interchange must receive a Class I brake test. These are similar to what is currently contained in § 232.12(a)(1)(iii); however, this paragraph retains two proposed provisions that are not contained in the existing regulations. The final rule will permit trains received in interchange to have a previously tested solid block of cars added to the train without requiring the performance of a Class I brake test. Currently, the addition of these types of cars to a train received in interchange would require the performance of an initial terminal inspection. As long as the added block of cars has been previously tested, FRA sees no safety hazard in permitting the cars to be added to a train at an interchange location. Furthermore, the final rule will permit a train that is received in interchange, and that will travel no more than 20 miles from the interchange location, to have its consist changed other than as provided in paragraph (a)(5) without being required to receive a Class I brake test; provided that, any cars added to the consist at the interchange location receive at least a Class II brake test pursuant to § 232.209. Historically, FRA has not had a problem with these shorter distance trains and believes that a Class II brake test on those cars added to the train is sufficient to ensure the safety of these operations.

Paragraph (b) details the required tasks comprising a Class I brake test. A proper Class I brake test ensures that a train is in proper working condition and is capable of traveling to its destination with minimal problems en route. The final rule retains virtually all of the provisions proposed in the NPRM regarding the specific tasks that are to be part of the Class I brake test, which include most of the tasks currently

required by § 232.12(c)-(h) for an initial terminal brake test, with some modification in the interest of standardization and clarity.

The final rule retains a standardized brake-pipe reduction of 20 psi for virtually all brake inspections and tests as was proposed in the 1994 and 1998 NPRMs. FRA agrees with both labor and management commenters that a standard brake-pipe reduction will simplify train brake tests and will make it easier to train workers. The 20-psi standardized reduction was suggested by both labor and management representatives.

The brake-pipe leakage test will continue to be a valid method of qualifying brake systems. However, the final rule retains the air flow method of testing the condition of the brake pipe as an acceptable alternate to the brake-pipe leakage test. The air flow method (AFM) would be an alternative only for trains having a lead locomotive equipped with a 26-L brake valve or equivalent and outfitted with an EOT device. The maximum allowable flow would be 60 CFM. The AFM of qualifying train air brake systems has been allowed in Canada as an alternative to the leakage test since 1984. In addition, several railroads in the United States have been using the AFM since 1989 when FRA granted the AAR's petition for a waiver of compliance to permit the AFM as an alternative to the leakage test. FRA recognizes the concerns of several labor organization commenters opposing the adoption of the AFM; however, FRA believes these commenters' apprehension is based on their unfamiliarity with the method. As FRA pointed out in the ANPRM, the 1994 NPRM, and the 1998 NPRM, the AFM is a much more comprehensive test than the leakage test. See 57 FR 62551, 59 FR 47682-47683, 63 FR 48305-06. The AFM tests the entire brake system just as it is used, with the pressure-maintaining feature cut in. FRA believes the AFM is an effective and reliable alternative method of qualifying train brakes. In the 1998 NPRM, FRA expressed some concern regarding the use of the AFM on short trains. However, based on consideration of the comments received and FRA's experiences in observing the use of the AFM, FRA agrees that the AFM should be permitted as an alternative on any train provided the 15 psi gradient is maintained on the train.

The brake-pipe gradient of 15 psi has been retained for both the leakage and air flow method of train brake testing; however, the minimum rear-car pressure has been increased to at least

75 psi, which will require a locomotive brake-pipe pressure of at least 90 psi. FRA feels that the added margin of braking power justifies the increase in pressure. The final rule modifies the language used in the proposed provisions related to the air pressure at which the brake tests are to be conducted based on comments submitted by the NTSB. The NTSB noted that the language used by FRA in the NPRM to describe the air pressure settings for conducting the required brake tests would permit some road trains to be tested at a lower pressure than that at which the train would be operated. The NTSB contends that although most road freight trains operate at 90 psi, some road freight trains are operated at 100 psi and the proposal would permit them to be tested at 90 psi. FRA agrees with NTSB's suggestion that a train's brake system should be tested at the pressure at which the train will operate and has modified the language of the final rule accordingly. Consequently, the final rule requires that the brake system be charged to the pressure at which the train will be operated and that the rear car pressure be within 15 psi of that pressure and not less than 75 psi when conducting the required brake tests and inspections.

Based on FRA's experience over the last several years and based on numerous comments received by FRA verifying the high reliability of the rear-car pressure transducers used in reporting brake-pipe pressure by an end-of-train (EOT) device, FRA now feels comfortable and justified in allowing the use of EOT devices in establishing the rear car pressure for Class I brake tests. FRA currently has requirements in place for the inspection and testing of EOT devices at the time of installation, which have been incorporated into subpart E of this proposal. However, in using an EOT to verify rear car pressure during a Class I brake test, the reading of the rear car air pressure is only permitted from the controlling or hauling locomotive of the train. Under no circumstances may train air brake pressure be read from a remote highway vehicle, another locomotive not attached to the train, or at any other location such as a remote unit installed in an office or shop.

Paragraph (b)(2) retains the proposed language regarding the duties of individuals performing brake inspections contained in this final rule. The language in this paragraph is reiterated in the final rule provisions on both the Class IA and Class II brake tests in order to ensure the proper performance of brake inspections.

Contrary to the assertions of some commenters, FRA believes that the proposed provisions sufficiently detailed how the various inspections were to be performed while providing flexibility for railroads to conduct the inspections in a manner most conducive to their operations. The methods of inspection proposed in the 1998 NPRM incorporated current practices and technical guidance previously issued by FRA.

Over the last few years there has been extensive debate concerning what constitutes a proper train air brake test under the current provisions contained in part 232, particularly relating to the positioning of the person performing the brake inspection. In early 1997, FRA issued a technical bulletin to its field inspectors in an attempt to clarify what must be done in order to properly perform a brake test. This technical bulletin stated that inspectors must position themselves in such a manner so as to be able to observe all of the movable parts of the brake system on each car. At a minimum, this requires that the inspector observe both sides of the equipment sometime during the inspection process. FRA continues to believe that both sides of the equipment must be observed sometime after the occurrence of activities that have the likelihood of compromising the integrity of the brake components of the equipment, such as: hump switching; multiple switching; loading; or unloading. FRA also agrees with the comments submitted by several railroad representatives that if one side of the equipment is inspected to ensure the proper attachment and condition of brake components and the proper condition of brake shoes on that side and the application of the brakes is observed from the other side of the equipment, then based on the design of brake systems today it can be safely assumed that in virtually every case an application of the brakes is occurring on the other side of the equipment. Consequently, FRA would like to again make clear that both sides of the equipment do not necessarily have to be inspected while the brakes are applied if an adequate inspection of the brake components was conducted on both sides of the equipment sometime during the inspection process. However, FRA also intends to make clear that the piston travel on each car must be inspected while the brakes are applied; thus, an inspector must take appropriate steps to make this observation.

As indicated in the NPRM, FRA does not intend to mandate specific methods for how the various inspections are to be performed. FRA believes that each

railroad is in the best position to determine the method of inspection that best suits its operations at different locations. To require that all inspections be performed by walking the train, as suggested by several labor representatives, would impose a huge financial and operational burden on the railroads and would ignore the various different methods by which inspections are currently performed and have been performed for years. FRA has never mandated specific step-by-step procedures for conducting brake inspections but merely requires that, whichever method is used, it must ensure that all of the components required to be inspected will be so inspected.

Paragraph (b)(4) contains the requirements for ensuring that a proper application of a car's brakes is made during the performance of brake inspections and provides the procedures for retesting a car found not to be properly applied during the initial performance of a brake inspection. In proposing the requirements contained in this paragraph, FRA attempted to clarify language contained in the current regulation which requires that the brakes "apply." The existing language has been misinterpreted by some to mean that if the piston applies in response to a command from a controlling locomotive or yard test device, and releases before the release signal is given, the brake system on that car is in compliance with the regulation because the brake simply applied. The intent of the regulation has always been that the brakes apply and remain applied until the release signal is initiated from the controlling locomotive or yard test device. In order to eliminate any confusion, this paragraph requires that the brakes on a car must remain applied until the appropriate release signal is given. If the brakes on a car fail to do so, the car must either be removed from the train or repaired in the train and retested as discussed below.

This paragraph retains the general concepts for retesting cars with brakes that are found not to apply or not to remain applied that were proposed in the NPRM. However, some of the specific requirements for performing a retest have been modified from those proposed in the NPRM based on FRA's consideration of the comments submitted and its determination that the proposed retesting provisions may have been overly restrictive. This paragraph modifies the proposed retest requirements by permitting any car found with brakes not applied during a required inspection to be retested

rather than just cars with obvious defective conditions. FRA agrees with the assertions of several commenters that there are a number of circumstances where the reason for the failure of the brakes to apply is not readily apparent. This paragraph reduces the amount of time that the brakes on a retested car must remain applied to three minutes from the proposed five minutes. The final rule makes clear that the brakes on a retested car remain applied until the release is initiated and that the release be initiated no less than three minutes after the application of the brakes. FRA believes three minutes is consistent with the amount of time it would take a person to conduct a complete inspection of the retested car's brakes. This paragraph also permits a car to be retested with the use of a suitable device positioned at the car being retested rather than from the head of the consist or from the controlling locomotive. When a retest is performed in this fashion, the final rule requires that the compressed air be depleted from the car being retested prior to separating the train line to perform the retest in order to prevent potential injury to employees conducting the retest. This paragraph also makes clear that any retest performed must be conducted at the air pressure at which the train will be operated. The modifications made to the retesting requirements in this paragraph are reiterated or referenced in the other types of brake inspections required in this subpart. A detailed discussion regarding the modifications made to the retesting provision is contained in the preceding "Overview of Comments and General FRA Conclusions" portion of the preamble under the heading "II. D. Retesting of Brakes."

Paragraph (b)(5) retains the proposed and current requirement that piston travel be adjusted during the performance of a Class I brake test if it is found outside the nominal limits established for standard 8½ inch and 10-inch diameter brake cylinder or outside the limits established for other types, which will be contained on a stencil, sticker, or badge plate. This provision is identical to that proposed in the NPRM and is similar to the provision currently contained at § 232.12(f). The major difference is that FRA has modified the existing provision to require that piston travel found to be less than 7 inches or more than 9 inches must be adjusted nominally to 7½ inches. This change is based on a request by AAR to change the adjustment to 7½ inches from 7 inches as its member railroads were finding it extremely difficult to adjust the piston

travel to precisely 7 inches and that in some cases the adjustment would be marginally less than 7 inches, thus requiring a readjustment. Thus, AAR sought the extra ½ inch in order to provide a small measure for error when the piston travel is adjusted. As FRA believes that AAR's concerns are validly placed and would have no impact on safety, FRA has accommodated the request.

Paragraph (b)(7) retains the proposed provision which clarified that brake connection bottom rod supports will no longer be required on bottom connection rods secured with locking cotter keys. FRA recognizes that there is no need for bottom rod safety supports in these circumstances and intends to relieve railroads of this unnecessary expense, which will provide the industry a cost savings without compromising safety.

Paragraph (b)(8) retains the proposed provisions relating to the performance of "roll-by" inspections of the release of the brakes on the cars of the train. This method of inspection has been used for years even though there is nothing in the current regulation which specifically addresses the method. The authority to use this method of inspection of the brake release permits railroads to expedite the movement of trains and has not proven to create a safety hazard. Therefore, this paragraph is intended to clarify the authority of railroads to use such a method and to ensure that the inspection is performed properly. This paragraph makes clear that when a railroad is performing a "roll-by" inspection of the brake release the train's speed shall not exceed 10 mph, that the qualified person performing the "roll-by" inspection shall notify the engineer when and if the "roll-by" has been successfully completed, and that the operator of the train shall note successful completion of the release portion of the inspection on the written or electronic notification required by this final rule. FRA intends to make clear that the notification to the engineer may be made through a hand held radio, a cellular telephone, or communication with a train dispatcher but that such information must be provided to the engineer prior to the train's departure. Based on the rationale provided for permitting only one side of a train to be inspected during the application of the brakes, FRA intends to make clear that only one side of the train must be inspected during the release portion of a brake test. However, paragraph (b)(2) makes clear that a "roll-by" inspection of the brake release shall not constitute an inspection of that side

for purposes of inspecting both sides during the inspection.

Paragraph (c) generally retains the provision as it was proposed in the NPRM and as currently contained in § 232.12(a), with slight modification for clarity, stating that a carman alone will be considered a qualified person if a railroad's collective bargaining agreement (CBA) provides that carmen are to perform the inspections and tests required by this section. FRA received a number of comments from various labor representatives objecting to FRA's proposed modification of the provision that currently exists in § 232.12(a). These commenters contended that the proposed language would alter the meaning of the existing provision and effectively eliminate its enforceability. Particularly, they objected to the proposed addition of the word "only" in the first sentence of the provision and the proposed elimination of the phrase "existing or future collective bargaining agreement." They contend that no CBA provides that only a carman may perform the inspections and that it is unclear whether the provision will apply to future CBAs due to the elimination of the specific language to that effect. They also asserted that it is unnecessary to require that carmen be trained as a qualified person or a QMI since carmen were recognized as the craft qualified to perform the inspection in 1982.

FRA's intent in proposing this provision was to clarify the meaning of the provision and explain FRA's ability to enforce the existing provision. FRA's intent was neither to expand nor reduce the applicability of the provision. FRA recognizes that its proposed addition of the word "only" could have the effect of altering the provision in a way that was not intended as FRA agrees that many existing CBAs do not require that only a carman perform the inspections. Thus, the language of the provision in this final rule eliminates the word "only" from the proposed clause, "Where a railroad's collective bargaining agreement provides that only a carman is to perform the inspections and tests required by this section. \* \* \*" However, FRA does not agree that it is necessary to include the phrase "existing or future collective bargaining agreement," as suggested by some commenters. FRA intends for the reference to a collective bargaining agreement to include any existing or future CBA. FRA believes that the inclusion of the suggested phrase is unnecessary because the plain meaning of the text is the CBA that applies at the time the issue arises. FRA sees no way to read the provision contained in this

final rule as not to include both existing and future CBAs.

FRA also believes that it is essential for railroads to ensure that the individuals required to perform the inspections covered by this provision are properly trained and qualified to perform the inspections. As the requirements contained in this final rule for performing these inspections differ somewhat from the existing regulation, FRA believes it is necessary for employees performing the inspections to be trained on these new requirements. This paragraph merely makes clear that, in circumstances where a collective bargaining agreement requires that a carman is to perform the inspections and tests required by this section, the railroad shall bear the responsibility of ensuring that the carman responsible for performing this task is properly trained and designated as qualified to perform the task. In these circumstances, FRA believes that the railroad must ensure that the employees with whom they have collectively bargained to perform the inspections and tests required by this section are properly trained and designated to perform the task. Furthermore, FRA believes that on virtually all railroads carmen will be sufficiently trained and experienced to be considered "qualified persons" and "qualified mechanical inspectors" as defined in this proposal, provided they receive some additional training on the specific requirements contained in this final rule.

The original provision was added to the regulations in 1982 when the distance between brake inspections was increased from 500 miles to 1,000 miles. The provision was included as part of an agreement between the railroads and rail labor for permitting the maximum distance between brake tests to be increased and was presented to FRA at the time. The language contained in that agreement was included in the 1982 regulatory revisions without change by FRA. Consequently, due to the circumstances under which this provision was added to the regulations and because it has existed for over 16 years, FRA feels compelled to retain the language in this final rule. FRA will continue to interpret the provision as it has always interpreted the provision. In circumstances where a railroad's collective bargaining agreement requires that a carman perform the inspections and tests required by this section, a carman alone will be considered a qualified person. This has been FRA's approach to the provision since its inception.

As FRA lacks the authority to issue binding interpretations of collective

bargaining agreements, FRA lacks the authority to settle a dispute between a railroad and its employees as to which group of its employees is to perform what work. FRA intends to make clear, that in order for FRA to proceed with an enforcement action under the provision contained in this paragraph, one of the parties to the collective bargaining agreement would first have to obtain a decision from a duly authorized body interpreting the relevant agreement, specifically identifying the involved location, and adequately resolving all of the interpretative issues necessary for FRA to conclude that the work belongs to a particular group of employees.

Paragraph (d) contains the requirement regarding the notification to the locomotive engineer and train crew of the successful completion of a Class I brake test by a qualified person. This paragraph slightly modifies the notification requirement from that proposed in the NPRM. In the NPRM, FRA proposed that the engineer be informed in writing of the successful completion of the Class I brake test. The intent of this proposed requirement was to ensure that the locomotive engineer was adequately informed of the results of the inspection; however, FRA recognizes that a requirement to provide the information in writing ignores technological advances and operational efficiencies. Consequently, this paragraph permits the notification to be made in whatever format the railroad deems appropriate; provided that the notification contains the proper information and a record of the notification and the requisite information is maintained in the cab of the controlling locomotive. FRA believes these changes are consistent with the intent and purpose of the proposed requirement for written notification and ensure necessary information is relayed to the operator of the train.

Paragraph (f) retains the proposed and existing requirements relating to the adding of cars or blocks of cars while a train is en route. This paragraph informs railroads that cars picked up en route that have not been previously tested and kept connected to a source of compressed air are to receive a Class I brake test when added to the train. Alternatively, a railroad may elect to perform only a Class II brake test at the time that a car is added to the train en route, but FRA intends to make clear that if this option is elected then the cars added in this fashion must be given a Class I brake test at the next forward location where facilities are available for providing such attention.

**Section 232.207 Class IA Brake Tests—1,000-Mile Inspection**

This section retains the proposed requirements related to the performance of a Class IA brake test. Many of the provisions contained in this section are currently contained at § 232.12(b) regarding the performance of 1,000-mile inspections. FRA has modified some of the existing requirements for purposes of clarity and has added a few additional requirements in order to make the inspection requirement more enforceable and to prevent some of the current abuses which FRA field inspectors have observed in their enforcement activities.

FRA recognizes that since 1982 new technologies and improved equipment have been developed that allow trains to operate longer distances with fewer defects. The data submitted by AAR appear to support this assertion, and FRA does not dispute the potential capability of certain equipment to travel distances in excess of 1,000 miles without becoming defective. However, the capability of the equipment to travel extended distances safely is contingent on the condition of the equipment when it begins operation and on the nature of the operation in which it is to be engaged. FRA believes that in order for brake equipment to travel extended distances between brake inspections, the condition and planned operation of the equipment must be thoroughly assessed at the beginning of a train's journey through high quality inspections. As noted in the general preamble discussion above, FRA believes that railroads are not conducting high quality initial terminal inspections at many locations because the railroads are utilizing employees who are not sufficiently qualified or trained to perform the inspections. Therefore, FRA believes that the 1,000-mile brake inspection interval continues to be necessary and important to ensure the safe operation of trains inspected by qualified personnel pursuant to this final rule. Furthermore, no trains operated in the United States are currently permitted to travel greater than 1,000 miles between brake inspections. Consequently, FRA is not willing to permit trains to travel in excess of 1,000 miles between brake inspections, except in the limited, controlled situations where data on the equipment can be gathered. (See discussion and provisions related to "Extended Haul Trains.") FRA notes that Canada eliminated intermediate inspections in 1994. However, Canada has different inspection requirements than those contained in this final rule and vastly different operating

conditions and environments than those prevalent on most American railroads, operating conditions and environments that are more conducive to the inspection regimen imposed by that country.

Paragraph (a) provides that each train shall receive a Class IA brake test at a location that is not more than 1,000 miles from the point where any car in the train last received a Class I or Class IA brake test. FRA intends to make clear that the most restrictive car or block of cars in the train will determine the location where this test must be performed. For example, if a train departs point A and travels 500 miles to point B where it picks up a previously tested block of cars en route which has travelled 800 miles since its last Class I brake test and the crew does not perform a Class I brake test when entraining the cars, then the entire train must receive a Class IA brake test within 200 miles from point B even though that location is only 700 miles from point A.

Paragraph (b) contains the tasks which must be performed when conducting a Class IA brake test. These tasks are virtually identical to some of the tasks required to be performed during a Class I brake test. A leakage or air flow test must be performed. Thus, when locomotives are equipped with a 26-L brake valve or equivalent, FRA will permit the use of the air flow method as an alternative to the brake pipe leakage test. This paragraph makes clear that the brakes shall apply on each car in the train in response to a 20-psi brake pipe reduction and shall remain applied until a release is initiated. In addition, the paragraph reiterates the parameters for performing a retest of the brakes on those cars found not to have sufficiently applied, which are contained in the Class I brake test requirements. It should be noted that, defective equipment may be moved from or past a location where a Class IA brake test is performed only if all of the requirements contained in § 232.15 have been satisfied. The only change to the tasks contained in this paragraph from those proposed in the NPRM is the clarification that the brake system be charged to the pressure at which the train will be operated and that the rear car pressure be within 15 psi of that pressure and not less than 75 psi when conducting the required brake tests and inspections. This change is identical to the change made in the Class I brake test and is discussed in detail in that section.

This paragraph also makes clear that in order to properly perform a Class IA brake test under this section both sides of the equipment must be observed

sometime during the inspection process. FRA finds the comments of AAR and other railroad representatives contending that both sides of the equipment should not be required to be inspected at Class IA brake tests to lack merit. The Class IA brake test basically incorporates the current 1,000-mile brake inspection, which FRA believes requires an inspection of both sides of the equipment during the inspection process. The current 1,000-mile inspection requires that brake rigging be inspected to ensure it is properly secure and does not bind or foul and that the brakes apply on each car in the train. See 49 CFR 232.12(b). In order to make these inspections properly, FRA believes that both sides of the equipment must be observed sometime during the inspection process and, to FRA's knowledge, railroads currently conduct these inspections in this manner. Thus, the NPRM and the final rule merely clarify what is required to be performed under the current regulations to properly perform a 1,000-mile inspection. Therefore, contrary to the contentions of certain commenters, retention of this current requirement does not impose any additional burden on the railroads.

Paragraph (c) retains the proposed provision which would require railroads to maintain a list of locations where Class IA inspections will be performed and that FRA be notified at least 30 days in advance of any change to that list of locations. Based on a review of the comments submitted, FRA recognizes that the proposed requirement for designating locations where Class IA inspections will be performed was somewhat unclear and may have caused confusion. The intent of the proposed requirement was to ensure that FRA was informed of those locations where a railroad intends to perform Class IA brake inspections and that FRA had the information with which to hold the railroad responsible for conducting the inspections at those locations. FRA was not intending to require that railroad separately identify a specific Class IA inspection location for each train it operates. Consequently, this paragraph has been slightly modified from that proposed in order to make clear that the designation required is for locations where such inspections will be performed and permits deviance from those locations only in emergency situations.

The current regulations merely require that railroads designate locations where intermediate 1,000-mile brake inspections will be performed but place no limitation on changing the locations. Therefore, FRA has found

some railroads changing the locations where these intermediate inspections are to occur on a daily basis which prevents FRA from observing these inspections being performed or avoids full performance of the required inspection by mechanical forces. In order to ensure that these types of inspections are being properly performed, FRA must be able to determine where the railroad plans to conduct these types of inspections. This paragraph recognizes that there may be occurrences or emergencies, such as derailments, that make it impossible or unsafe for a train to reach a location that the railroad has designated as a Class IA inspection site. Consequently, this paragraph permits railroads to bypass the 30-day written notification requirement in these instances provided FRA is notified within 24 hours after a designation has been changed. This paragraph also makes clear that failure to perform a Class IA brake test at a designated location will constitute a failure to properly perform the inspection.

*Section 232.209 Class II Brake Tests—Intermediate Inspection*

This section contains the requirements related to the performance of Class II brake tests. The requirements contained in this section are similar to the proposed requirements and the requirements currently contained in § 232.13(d) but have been slightly modified for clarity and to address situations where solid blocks of cars are added to an en route train. Paragraph (a) identifies those cars that are required to receive a Class II brake test when added to a train. This paragraph has been modified to address situations when certain “solid blocks of cars” are added to a train. As discussed previously, the final rule modifies the definition of “solid block of cars” from that proposed in the NPRM. (See section-by-section analysis of § 232.5.) Although FRA believes the definition it proposed was consistent with current interpretations and enforcement of the requirement, FRA agrees with some of the commenters that the definition may have been too narrow and did not directly address FRA’s primary concern, the block of cars itself. FRA’s primary concern is the condition of the block of cars being added to the train especially when the block of cars is made up of cars from more than one train. Thus, the final rule permits a “solid block of cars” to be added to a train without triggering a requirement to perform a Class I brake test on the entire train. However, this paragraph identifies the situations when

“solid blocks of cars” must be inspected when added to a train.

This paragraph makes clear that a car or a solid block of cars that has not previously received a Class I brake test or that has been off a source of compressed air for longer than four hours must, at a minimum, receive a Class II brake test when added to an en route train. This paragraph also makes clear that a Class II brake test is required to be performed on each “solid block of cars” added to a train which is composed of cars from more than one other train or that is composed of cars from only one other train but that have not remained continuously and consecutively coupled together. It should be noted that this paragraph specifically acknowledges that the removal of defective equipment from a solid block of cars will not result in the solid block of cars being considered not to be continuously and consecutively coupled together. FRA believes this approach is consistent with the intent of both FRA and Congress to have defective equipment repaired as quickly as possible.

Paragraph (b) retains the proposed tasks which must be performed when conducting a Class II brake test. The only changes to the tasks contained in this paragraph from those proposed in the NPRM is the clarification that the brake system be charged to the pressure at which the train will be operated and that the rear car pressure be within 15 psi of that pressure and not less than 75 psi when conducting the required brake tests and inspections and the procedures for performing retests on cars. These changes are identical to the changes made in the Class I and Class IA brake tests and are discussed in detail in those sections.

A Class II brake test is intended to ensure that the brakes on those cars added apply and release and that the added cars do not compromise the integrity of the train’s brake system. Therefore, a leakage or air flow test must be performed when the cars are added to the train to ensure the integrity of the train’s brake system. This paragraph makes clear that in order to properly perform an inspection under this section both sides of the equipment must be observed sometime during the inspection process. This paragraph also makes clear that the brakes shall apply on each car added to the train and remain applied until a release is initiated and reiterates the parameters that are contained in the Class I brake test requirements for performing a retest on those cars whose brakes were found not to have sufficiently applied. It should be noted that, defective

equipment may be moved from or past a location where a Class II brake test is performed only if all of the requirements contained in § 232.15 have been satisfied. Paragraph (b) also requires that the release of the brakes on those cars added to the train and on the rear car of the train be verified and allows railroads to conduct “roll-by” inspections for this purpose.

Paragraph (c) continues to permit the proposed and existing alternative to the rear car application and release portion of this test. This alternative permits the locomotive engineer to rely on a rear car gauge or end-of-train device to determine that the train’s brake pipe pressure is being reduced by at least 5 psi and then restored by at least 5 psi in lieu of direct observation of the rear car application and release. Although certain labor representatives contended that this practice should not be allowed and that it is in violation of the existing regulations, this alternative has been permitted for years under the current regulations (§ 232.13(c)(1), (d)(1)) without any degradation of safety, and thus, FRA intends to permit the practice to continue.

Paragraph (d) retains the proposed and existing requirements relating to the inspection of cars or blocks of cars added to a train while a train is en route. This paragraph makes clear that if cars are given a Class II brake test when added to a train then the cars added must receive a Class I brake test at the next forward location where the facilities are available for performing such an inspection.

*Section 232.211 Class III Brake Tests—Trainline Continuity Inspection*

This section contains the requirements related to the performance of Class III brake tests. The requirements contained in this section are generally the same as those proposed, which incorporated the requirements currently contained in § 232.13(c), but have been slightly modified for clarity and standardization with the changes made in other inspection requirements contained in this final rule. Some of the changes made in this section from that proposed clarify the need to perform a Class III brake test when a solid block of cars is added to a train which does not require the performance of either a Class I or Class II brake test. Paragraph (b) of this section has been modified to incorporate the clarification that the brake system be charged to the pressure at which the train will be operated and that the rear car pressure be within 15 psi of that pressure and not less than 75 psi when conducting the required inspection.

The purpose of a Class III brake test is to ensure the integrity of the trainline when minor changes in the train consist occur. Basically, a Class III brake test ensures that the train brake pipe is properly delivering air to the rear of the train. FRA intends to make clear that this inspection is designed to be performed whenever the continuity of the brake system is broken or interrupted. For example, if a railroad disconnects a locomotive from a train consist to perform switching duties for a short period and then reattaches the locomotive to the consist, without any other change being made in the consist, the railroad would be required to perform a Class III brake test prior to the train's departure. Similarly, a Class III brake test would be required if a railroad disconnects a locomotive from the train and adds a different locomotive to the train, only to discover that the added locomotive is not operating properly, and thus, adds the original locomotive back into the consist. Because the continuity of the trainline was interrupted when the locomotive was removed and then placed back in the train, even though the same cars and locomotives remained in the consist, a Class III brake test must be performed.

Paragraphs (b) and (c) contain the tasks related to the performance of a Class III brake test. These paragraphs require that the brakes on the rear car of the train apply in response to a 20-psi brake pipe reduction and that the brakes subsequently release on the rear car of the train when the release is initiated. Similar to a Class II brake test, paragraph (c) permits an alternative to direct observation of the application and release of the rear car's brakes by permitting the operator to rely on a rear car gauge or end-of-train device to determine that the brake pipe pressure is being reduced and restored in response to the controlling locomotive.

#### *Section 232.213 Extended Haul Trains*

This section generally retains the proposed provisions, which permit an extension of the allowable maximum distance a train may travel between train brake system tests. After consideration of all the comments submitted on this matter, FRA continues to believe that if a train is properly and thoroughly inspected, with as many defective conditions being eliminated as possible, then the train is capable of traveling much greater than 1,000 miles between brake inspections. (A detailed discussion of the comments submitted on this issue is contained in the preceding "Overview of Comments and General FRA Conclusions" portion of

the preamble under the heading "II. B. Extended Haul Trains.") Therefore, the final rule retains the provisions permitting railroads to designate trains as extended haul trains and allowing such trains to be operated up to 1,500 miles between brake inspections. Although FRA recognizes that retention of the 1,500-mile limitation may limit the utility of the provision on some railroads, FRA is not willing to increase the proposed mileage restriction at this time. Currently, no train is permitted to travel more than 1,000 miles without receiving an intermediate brake inspection. Therefore, FRA does not believe it would be prudent to immediately double or triple the currently allowed distance without evaluating the safety and operational effects of an incremental increase in the distance. Consequently, until sufficient information and data are collected on trains operating under the provisions contained in this final rule, FRA is not willing to permit trains to travel the distances suggested by some commenters without additional brake inspections. FRA continues to believe that the requirement for performing inbound inspections and the requirement to maintain records of all defective conditions discovered on these trains provides the basis for developing the information and data necessary to determine the viability of allowing greater distances between brake inspections.

After consideration of the comments submitted, FRA agrees that the benefits estimated in the NPRM in association with the extended haul provisions may have been overstated. FRA realizes that the retention of the 1,500-mile limitation may eliminate certain trains from being operated pursuant to the extended haul provisions and reduce the benefits estimated at the NPRM stage of the proceeding. (See detailed discussion in the Regulatory Impact Analysis portion of the preamble below.) In order to increase the viability of the extended haul provisions, the final rule provides some flexibility for designating extended haul trains and allows for the limited pick-up and set-out of equipment as discussed below.

Certain commenters have portrayed the provisions related to extended haul trains as merely being an extension of the current intermediate inspection distances. FRA objects to such a characterization. In FRA's view, the extended haul provisions contained in this section constitute a completely new inspection regimen. This section contains stringent inspection requirements, both brake and mechanical, by highly qualified

inspectors and establishes stringent requirements whenever cars are added to or removed from such trains. This section also contains a means to assess the safety of such operations by requiring that records be maintained of the defective conditions that develop on these trains while en route. Consequently, FRA believes that the requirements related to extended haul trains not only ensure the safe operation of the trains operated under them, but actually increase the safety of such operations over that which is provided in the current regulations.

In paragraph (a), FRA generally retains the proposed provisions permitting railroads to designate specific trains that will move up to 1,500 miles between brake and mechanical inspections provided the railroad meets various stringent inspection and monitoring requirements, which FRA believes will ensure the safe and proper operation of these trains. FRA intends to make clear that a railroad must meet all of the requirements contained in this paragraph in order to designate a train as an extended haul train. Paragraph (a)(1) contains the requirements for designating trains a railroad intends to move in accordance with this section. Several commenters contended that the proposed provisions regarding the advance designation of extended haul trains would prohibit certain unscheduled trains from being operated as extended haul trains. In an effort to provide some flexibility in this area, this paragraph has been modified to allow railroads to designate certain locations as locations where extended haul trains will be initiated and requires railroads to describe those trains that will be so operated rather than requiring specific identification of every train. FRA believes this modification will allow railroads to capture some of their unscheduled trains by identifying the trains by the locations where they originate. This paragraph sets forth the information that must be provided to FRA in writing when designating a train or a location for such operation. The information required to be submitted is necessary to facilitate FRA's ability to independently monitor a railroad's operation of these extended haul trains.

FRA continues to believe that in order for a train to be permitted to travel 1,500 miles between inspections, the train must receive inspections that ensure the optimum condition of both the brake system and the mechanical components. In paragraphs (a)(2), (a)(3), and (a)(8), FRA retains the proposed requirement that these inspections be performed by highly qualified and experienced

inspectors in order to ensure that quality inspections are being performed. As FRA intends the Class I brake tests that are required to be performed on these trains to be as in-depth and comprehensive as possible, FRA continues to believe that these inspections must be performed by individuals possessing not only the knowledge to identify and detect a defective condition in all of the brake equipment required to be inspected but also the knowledge to recognize the interrelational workings of the equipment as well as a general knowledge of what is required to repair the equipment. Therefore, paragraphs (a)(2) and (a)(8) retain the use of the term "qualified mechanical inspector" to identify and describe those individuals it believes possess the necessary knowledge and experience to perform the required Class I brake tests on these trains. A "qualified mechanical inspector" is a person with training or instruction in the troubleshooting, inspection, testing, maintenance, or repair of the specific train brake systems for which the person is assigned responsibility and whose primary responsibilities include work generally consistent with those functions. (See § 232.5 of this section-by-section analysis for a more detailed discussion of "qualified mechanical inspector.") FRA also continues to believe these same highly qualified inspectors must be the individuals performing the required inbound inspection, contained in paragraph (a)(6) of this section, on these extended haul trains in order to ensure that all defective conditions are identified at the train's destination or 1,500 mile location. Similarly, in paragraph (a)(3), FRA requires that all of the mechanical inspections required to be performed on these trains be conducted by inspectors designated pursuant to 49 CFR 215.11, rather than train crew members, in order to ensure that all mechanical components are in proper condition prior to the trains departure.

As discussed in detail above, FRA is not willing to allow more than 1,500 miles between brake inspections until appropriate data are developed which establish that equipment moved under the criteria contained in this final rule remains in proper condition throughout the train's journey. FRA believes that the provisions contained in paragraphs (a)(6) and (a)(7), requiring the performance of an inbound inspection at destination or at 1,500 miles and requiring carriers to maintain records of all defective conditions discovered on these trains for a period of one year,

create the basis for developing such data. FRA believes the information generated from these inbound inspections will be extremely useful in assessing the quality of a railroad's inspection practices and will help FRA identify any systematic brake or mechanical problems that may result in these types of operations. It should be noted that paragraph (a)(7) has been slightly modified from what was proposed in order to clarify that the required records may be maintained either electronically or on paper.

Paragraphs (a)(4) and (a)(8) retain the proposed requirements that these trains have 100 percent operative brakes and contain no cars with mechanical defects under part 215 at either the train's initial terminal or at the time of departure from a 1,500-mile point, if moving in excess of 1,000 miles from that location. FRA has modified the provision proposed in paragraph (a)(5) that restricted extended haul trains from conducting any pick-ups or set-outs en route, except for the removal of defective equipment. Paragraph (a)(5) is modified to permit extended haul trains the limited ability make one pick-up and one set-out while en route. This modification will provide railroads the flexibility to set out a block of cars at one location and pick up a block of cars at the same or another location. FRA believes that this limited ability provides the railroads with some flexibility to move equipment efficiently while minimizing the disruptions made to the train's brake system and ensuring that cars added to such trains can be adequately tracked and inspected. Paragraph (a)(5) makes clear that any cars added to extended haul trains must be inspected in the same manner as the cars at the train's initial terminal. This paragraph also makes clear that any car removed from the train must be inspected in the same manner as a car at the train's point of destination or 1,500-mile location.

Paragraph (b) is retained as proposed and makes clear that failure to comply with any of the restrictions contained in this section will be considered an improper movement of a designated extended haul train for which appropriate civil penalties may be assessed. FRA has included specific civil penalties in appendix A to this final rule pertaining to the improper movement of these types of trains. In addition to the imposition of civil penalties, this paragraph makes clear that FRA reserves the right to revoke a railroad's authority to designate any or all trains for repeated or willful noncompliance with any of the provisions contained in this section.

#### *Section 232.215 Transfer Train Brake Tests*

This section generally retains the proposed requirements related to the performance of transfer train brake tests. The final rule requirements have been slightly modified for consistency with other inspection requirements and to clarify when a transfer train brake test is to be performed. The requirements contained in this section generally incorporate the requirements currently contained in § 232.13(e). "Transfer train" is defined in § 232.5 of this final rule as a train that travels between a point of origin and a point of destination, located not more than 20 miles apart. The definition makes clear a transfer train may pick up or deliver freight equipment while en route to its destination. This final rule makes clear that the decision as to whether a particular consist is subject to the transfer train inspection requirements is primarily based on a determination that the movement the train is engaged in is considered a "train movement" rather than a "switching movement." FRA's determination of whether the movement of cars is a "train movement," subject to the requirements of this section, or a "switching movement" is and will be based on the voluminous case law developed by various courts of the United States. (See section-by-section analysis for § 232.5 for a detailed discussion of the terms "train movement" and "switching movement.")

FRA intends to make clear that a train will be considered a transfer train only if the train moves no more than 20 miles between its point of origin and its point of final destination. If the train will move greater than 20 miles between the point of origin and point of final destination, it cannot be considered a transfer train, and a Class I brake test must be performed on the train prior to departure from its point of origin. Although cars may be added to a transfer train while the train is en route, as discussed below, with a transfer train brake test being performed on the cars added, the train is limited to a total of 20 miles from its point of origin, not from the location where new cars are added. The distance the entire train will move between its point of origin and point of final destination is the determinative factor in determining whether the train is a transfer train, cars dropped-off or picked-up en route do not affect this distance.

Paragraph (a) retains the proposed tasks that are required to be performed when conducting a transfer train brake test. Due to the short distance these

types of trains will travel, FRA will continue to permit the brake system to be charged to only 60 psi but will make clear that this must be verified by an accurate gauge or end-of-train device. Although the current regulations do not require the use of a gauge or device, FRA is at a loss to understand how an inspector can know the pressure in the brake system without getting a reading from the rear of the train. This paragraph also retains the requirement that the brakes apply in response to a 15-psi brake pipe reduction. FRA continues to believe that the reduced pressure at which this test is performed (i.e., 60 psi rather than 75 psi) requires that an application be obtained with a smaller pressure reduction than that required for other brake tests. This paragraph also makes clear that the brakes shall apply on each car added to the train and remain applied until a release is initiated and reiterates the parameters for performing a retest on those cars found not to have sufficiently applied that are contained in the Class I brake test requirements.

Paragraph (b) clarifies that cars may be added to a transfer train while it is en route to its destination. This activity is currently conducted by these trains, and it was not FRA's intent when issuing the NPRM to propose prohibiting these trains from being used in this fashion. This paragraph makes clear that when cars are added to a transfer train the added cars are to be inspected pursuant to the requirements contained in paragraph (a) of this section. This is generally consistent with what FRA currently requires when cars are added to a transfer train, and this paragraph has been added to clarify FRA's retention of the existing practice.

#### *Section 232.217 Train Brake System Tests Conducted Using Yard Air*

This section contains the requirements for performing train brake system tests when using yard air. The requirements contained in this section have been modified from those proposed in the NPRM in response to the comments and recommendations received. Paragraph (a) retains the proposed requirements regarding the use of an engineer's brake valve or a suitable test device capable of making any increase or decrease of brake pipe air pressure at the same, or slower, rate as an engineer's brake valve when conducting brake tests utilizing yard air. The requirement to use such a device also applies when retesting cars during Class I, Class IA, Class II, and transfer train brake tests.

Paragraph (b) generally retains the requirement to connect the air test

device to the end of the cut of cars that will be nearest to the controlling locomotive. However, this paragraph permits the test device to be connected to other than the end nearest the controlling locomotive if a railroad has appropriate procedures in place to ensure the safety of such a practice. FRA recognizes that some currently existing yards are designed in such a manner so that performance of a test from the front of the consist is extremely difficult or impossible. FRA also recognizes that the safety concerns that arise when cars are charged from other than the head-end of the consist can be eliminated if proper procedures are in place to ensure that overcharge conditions do not occur. An "overcharge condition" describes a situation in which the brake equipment of cars, or locomotives, or both is charged to a higher pressure than the maximum brake pipe pressure that can normally be achieved in that part of the train; this may result in the locomotive engineer's lacking the ability to control the application or release of the brakes at the rear of the train. This paragraph recognizes that there are a number of operating or testing procedures which may be used to eliminate the existence of potential overcharge conditions. Rather than specify a procedure, this paragraph permits a railroad to adopt and comply with whatever procedure it determines is best suited to its operation. However, this paragraph makes clear that the procedure must be in writing and that the procedure must be followed by the railroad. Consequently, FRA will hold a railroad responsible for complying with whatever procedure it adopts.

Paragraph (c) modifies some of the provisions related to conducting brake tests utilizing yard air sources that were proposed in the NPRM. Rather than requiring yard air tests to be performed at 80 psi as was proposed, this paragraph reduces the required pressure to 60 psi at the end of the consist as is currently required. FRA recognizes that many yard air sources and rental compressors are not capable of producing 80 psi of air pressure. In order to address the concerns raised regarding the inadequacy of conducting a leakage or air flow test at this lower pressure, this paragraph includes a requirement that leakage and air flow tests be conducted at the operating pressure of the train. Thus, if the yard air is not capable of producing the air pressure at which the train will be operated, then the leakage or air flow test must be conducted when the locomotives are attached. This paragraph also retains the proposed

requirement that a Class III brake test as proposed in § 232.211 must be performed on cars tested with yard air at the time that the road locomotive is attached. This paragraph also retains the proposed requirement for retesting cars that remain disconnected from a source of compressed air for more than four hours.

Paragraph (c) and (d) retain the proposed requirements regarding the calibration and accuracy of yard test devices and gauges with slight modification for clarity. Paragraph (c) requires that mechanical yard test devices and gauges be calibrated every 92 days and that electronic yard test devices and gauges be calibrated annually. Based on observations made by FRA's field inspectors, FRA has some concerns regarding the condition of many yard test devices and gauges. FRA has found numerous mechanical gauges the condition of which creates serious doubt as to the accuracy of the gauge. Mechanical gauges have been found with broken or missing glass which would allow moisture and other contaminants to be present in the gauge. As many of the yard test plants being used today are portable, they are exposed to a wide array of handling and environmental hazards while being transported from location to location. Therefore, this paragraph requires that mechanical devices and gauges be tested and calibrated every 92 days. On the other hand, electronic gauges and devices appear to have much less exposure to many of the hazards encountered by mechanical devices and gauges and tend to be much more reliable and accurate for a longer period of time. Consequently, this paragraph requires electronic yard test devices and gauges to be tested or calibrated, or both, on an annual basis. Paragraph (d) retains the proposed requirement that any yard air test device and any yard air test equipment used to test a train be accurate and function as intended. FRA will consider a device or gauge to be accurate if it is within the calibration parameters contained in paragraph (c) of this section.

#### *Section 232.219 Double Heading and Helper Service*

This section contains the requirements related to double heading and helper service. This section has been modified from that proposed in order to clarify that the requirements contained in this section do not apply to distributed power units and to remove unnecessary provisions. Thus, the second sentence of proposed paragraph (a) has been removed as the brake valve on distributed power units

are left cut in to accelerate response time. In addition, proposed paragraph (b) has been eliminated as it was originally intended to apply to passenger equipment and is not applicable to freight operations. Paragraph (a) retains the proposed clarification regarding the inspection that is to be performed when a controlling locomotive is changed. Paragraph (a) clearly identifies that a Class III brake test pursuant to § 232.211 must be performed when a new locomotive is placed in control of the train. FRA believes that the provisions retained in paragraph (a) are necessary and have been in place for years in order to ensure that locomotives taking control of a train have the ability to actually control the brakes on the train.

Paragraph (b), previously proposed as paragraph (c), retains the proposed requirement aimed at ensuring that the brake systems on helper locomotives respond as intended to brake commands from the controlling locomotive at the time it is placed in the train. Although the brake system on locomotives are required to be inspected on a daily basis, FRA continues to believe that a visual confirmation of the proper operation of a helper locomotive's brakes should be made at the time the locomotive is added to a train. Failure of a helper locomotive to respond to the command of the controlling locomotive could result in a very serious safety hazard in that a helper locomotive may continue to push the rear of the train while the brakes are applied, potentially resulting in a derailment or other incident. FRA intends to make clear in this paragraph that a helper locomotive found with inoperative or ineffective brakes is to be repaired prior to use or else removed from the train.

Paragraph (c) contains basic design and testing requirements for helper locomotives utilizing a Helper Link device or similar technology. The Helper Link device is an electronic device, mounted on the front end of the lead helper locomotive and is used to control the automatic air brakes on helper locomotive consists. When this device is used, the train's brake pipe is not connected between the rear car of the train being pushed and the helper locomotives. The end-of-train device, attached to the rear car of the train, sends a radio signal which is received by the Helper link device. The Helper Link device is connected to the brake pipe of the helper locomotives, and electronic commands from the EOT device cause the air pressure in the helper locomotive brake pipe to be reduced or increased, thus applying or releasing the brakes on the helper

locomotives. A signal is transmitted from the EOT device to the Helper Link device at 10-second intervals to ensure communication. The Helper Link is also used to operate the uncoupling lever to detach the helper locomotives from the rear of the train without stopping the train.

Based on information currently available to FRA, it appears that when there is a loss of communication between the EOT device and the Helper Link device, the engineer of the helper locomotive consist is not immediately aware of the failure. If the communication between the EOT device and the Helper Link is not reestablished within the next 40-second communication cycle, the Helper Link device will automatically disable itself. Consequently, if the train experiences an emergency application of the air brakes while the Helper Link device is disabled, the brakes on the helper locomotives would not apply and would result in the helper locomotives continuing to push under power. Furthermore, in order for communications to be reestablished between the EOT and Helper Link, the engineer must leave the locomotive controls, exit the locomotive cab, and proceed to the front of the locomotive to manually press the reset buttons located on the Helper Link device itself. In addition, there are currently no regulations which address the use, testing, or calibration of these Helper Link devices.

On August 22, 1996, the UTU submitted a petition for rulemaking with FRA regarding Helper Link devices raising many of the concerns noted above. See Petition for Proposed Rulemaking, Docket 96-1. In order to address the UTU petition in this rulemaking and to address the concerns of FRA noted above, FRA sought information and comment from persons interested in the NPRM. See 63 FR 48345. A presentation and discussion regarding the use, operation, and design of Helper Link devices was engaged in at the technical conference conducted in Walnut Creek, California, on November 23 and 24, 1998. Written comments regarding the device were also submitted by the manufacturer of the device. Based on consideration of this information, FRA has determined that certain minimum design and testing requirements should be included in this final rule to ensure the safety of those trains utilizing Helper Link technology.

Paragraph (c) contains the design and testing requirements that FRA believes are appropriate when railroads utilize Helper Link devices or similar technology. This paragraph ensures that

a locomotive engineer is notified by a distinctive alarm of any loss of communication for more than 25 seconds between the device and the two-way EOT. This paragraph also requires that the engineer be provided a method of resetting the device in the cab of the helper locomotive and that the device be tested and calibrated on an annual basis. Due to the limited number of Helper Link devices currently being used, FRA believes that the manufacturer of these devices can easily provide railroads utilizing the devices with the information and hardware to meet the requirements contained in this paragraph at a minimal cost to the railroad.

#### **Subpart D—Periodic Maintenance and Testing Requirements**

This subpart provides the periodic brake system maintenance and testing requirements for equipment used in freight and other non-passenger trains. As stated in the 1994 NPRM and 1998 NPRM, FRA firmly believes that the new repair track test and single car test, which have been used industry-wide since January of 1992, are a much better and more comprehensive method of detecting and eliminating defective brake equipment and components than the old, time-based COT&S requirements. FRA believes that performance of these tests has significantly reduced the number of defective components found and has dramatically increased the reliability of brake equipment. Through the implementation of the repair track and single car tests, the safety of both railroad employees and the public has greatly improved due to brake equipment being in better and safer condition. At the same time, however, FRA is cognizant that contentions by rail labor regarding the carrier's direct and intentional circumvention of these revised requirements through the elimination of repair tracks, by moving cars to expediter tracks for repair, or simply by making repairs in the field raise a legitimate concern that needs to be addressed to ensure that the industry fully benefits from the advantages of the improved tests.

Although this subpart retains many of the proposed maintenance requirements, several modifications have been made in this final rule in response to comments received and based upon the current best practices occurring within the industry. FRA agrees that the proposed incorporation of AAR Rule 3, Chart A, is unnecessary as it would remove the determination of when certain maintenance is performed from the discretion of the railroads, and

would make it difficult for railroads to change the requirements related to the performance of that maintenance. FRA believes that a railroad is in the best position to determine when and where it will perform various maintenance on its equipment and should not have its hands tied in this area by overly prescriptive federal requirements. Furthermore, FRA's primary intent when proposing incorporation of AAR Rule 3, Chart A, was to codify the existing requirements for performing single car and repair track air brake tests and eliminate the ability of the industry to unilaterally change the frequency and method of performing these tests. As this subpart retains the requirements for when and how these tests are to be completed and retains certain inspections that are to be performed when equipment is on a shop or repair track, FRA believes that it is unnecessary to incorporate every maintenance procedure covered in AAR's Rule 3, Chart A. Consequently, the final rule does not incorporate AAR's Rule 3, Chart A, and continues to allow railroads some flexibility in determining appropriate maintenance practices. (A detailed discussion of the comments and recommendations submitted on the maintenance requirements contained in this subpart is contained in the preceding "Overview of Comments and General FRA Conclusions" portion of the preamble under the heading "VII. Maintenance Requirements.")

#### *Section 232.303 General Requirements*

This section contains the general requirements regarding the maintenance, repair, and testing of freight cars. Paragraph (a) contains various definitions for determining whether a particular track or facility constitutes a shop or repair track. The definitions contained in this paragraph were not previously proposed in the NPRM but are consistent with current FRA enforcement policies and are necessary to clarify when various tests and inspections required in this section are to be performed.

As the current regulations and this subpart require that certain inspections and tests are to be performed when a car is on a shop or repair track and because a repair track air brake test is required to be performed when a car is on a repair track and such a test has not been performed within the last twelve months, FRA believes it is necessary to clarify what constitutes a shop or repair track. This issue has become more prevalent over the last few years due to the growing use of mobile repair trucks and due to the requirements for

conducting repair track air brake tests. For years, many railroads have conducted minor repairs on tracks called "expedite tracks." Generally, the types of repairs that were performed on these tracks were minor repairs that could be made quickly with a limited amount of equipment, and neither the railroads or FRA considered the tracks to be repair tracks. However, recently railroads have started performing virtually every type of repair on these expedite tracks. These tracks are no longer limited to minor repairs but are being used to perform heavy, complex repairs that require the jacking of entire cars or the disassembly and replacement of major portions of a car's truck or brake system. At many locations these expedite tracks are positioned next to operative repair shops. Furthermore, several railroads have closed previously existing repair shop facilities and are now using fully equipped mobile repair trucks to perform the same type of repairs that were previously performed in the shop or on established repair tracks and are attempting to call the tracks serviced by these mobile repair trucks "expedite" or "light repair" tracks. Thus, the line between what constitutes a repair or shop track and what constitutes an "expedite" or "light repair" track has become unclear or nonexistent.

Appendix A of AAR's Field Manual of Interchange Rules provides a definition of both "shop or repair track" and "expedite track." Although FRA does not consider these definitions to be controlling with regard to what constitutes a repair track under the current regulations, FRA does believe that AAR's definitions of the above terms have created confusion within the industry regarding what constitutes a repair track. If the AAR's definitions are read together they appear to exclude repairs made by mobile repair trucks, regardless of where they are made or the nature of the repairs conducted, from ever being considered as being performed on a repair track. FRA believes it is both illogical and inconsistent with the intent and meaning of the existing regulations and with the provisions proposed in the NPRM to exclude from the definition of "shop or repair track" tracks at locations where repairs of all types are regularly and consistently performed from merely because they are serviced by a mobile repair vehicle. Furthermore, it would be inconsistent with previous technical bulletins and enforcement guidance issued by FRA to allow major repair work to be performed on "expedite" or "light repair" tracks merely because the

repairs are performed by a mobile repair vehicle.

FRA believes that the operational changes, noted above, are partly an attempt by the railroads to circumvent the requirements that currently apply when a car is on a shop or repair track. Currently, if a car is on a shop or repair track, it must have its brakes inspected, under 49 CFR 232.17(a)(2)(ii), (iv), and the car is to receive a repair track air brake test if it has not received one in the last twelve months under AAR Rule 3, Chart A. Some railroads contend that an expedite track is not a repair or shop track; therefore, the requirements of § 232.17(a)(2)(ii), (iv) and AAR Rule 3, Chart A, do not apply. FRA finds this practice and interpretation to be unacceptable and believes that railroads are abusing the concept of expedite tracks to avoid performing required maintenance. Therefore, the industry's own actions have caused the need for FRA to clarify what constitutes a shop or repair track. Consequently, paragraph (a) includes a definition of what FRA will consider to be repair or shop tracks requiring the performance of certain tests and inspections.

Paragraph (a) makes clear that FRA will consider certain tracks to be repair or shop tracks based on the frequency and types of repairs that are made on the tracks, not necessarily the designation given by a railroad. The definitions in this paragraph also make clear that it is the nature of the repairs being conducted on a certain track that is the determining factor not whether a mobile repair truck is being used to make the repairs. Due to the ability of mobile repair trucks to make virtually any type of repair necessary and due to their growing use, FRA does not believe that tracks regularly and continually serviced by these types of vehicles should be excepted from the definition of "repair track." FRA believes that if a track is designated by the railroad as an "expedite" track (i.e., one where minor repairs will be conducted) then the railroad should ensure that only cars needing minor repairs are directed to that track for repair. FRA does not intend to eliminate the concept of expedite tracks but limits the use of such tracks to those types of repairs that are truly minor in nature and that require a limited amount of equipment to perform. At locations where a railroad conducts repairs of all types on a regular and consistent basis, either with fixed facilities or with mobile repair trucks, FRA would expect the railroad to designate certain trackage at the location as repair tracks and certain trackage as "expedite tracks" where only minor repairs would be conducted.

In such circumstances, FRA would expect railroads to direct cars in need of heavier repairs, the kind that have been traditionally performed on a shop or repair track, to be directed to trackage designated at the location as a repair track.

Paragraph (a) places the burden on the railroad to designate those tracks it will consider repair tracks at locations where it performs both minor and heavy repairs on a regular and consistent basis, and makes the railroad responsible for directing the equipment in need of repair to the appropriate trackage. If the railroad determines that repairs of a heavy nature will be performed on certain trackage, then the track should be treated as a repair track, and any car repaired on that trackage should be provided the attention required by this final rule for cars on a shop or repair track. Further, if a railroad determines that minor repairs will be performed on certain trackage, then the railroad bears the burden of ensuring that only cars needing minor repairs are directed to that trackage. If the railroad fails to adequately distinguish the tracks performing minor repairs from those tracks performing heavy repairs or improperly performs heavy repairs on a track designated as an "expedite track," then the railroad will be required to treat all cars on the trackage at the time that the heavy repairs are being conducted as though they are on a repair or shop track.

It should be noted that the issue of what constitutes a repair or shop track for the purposes of this subpart is completely separate and distinct from the issue of whether a location is a location where necessary repairs can be performed for purposes of 49 U.S.C. 20303 and § 232.15 of this final rule. Although an outlying location might be considered a location where certain brake repairs can be conducted, that does not mean the track where those repairs are performed should be considered a repair track. FRA does not intend for trackage located at outlying locations or sidings which are occasionally or even regularly serviced by mobile repair trucks to be considered repair tracks. FRA believes that repair or shop tracks should exist at locations that have fixed repair facilities and at locations where repairs of all types are performed on a regular and consistent basis regardless of whether the repairs are performed in fixed facilities or by mobile repair vehicles.

Paragraphs (b)–(d) retain the proposed provisions requiring certain tests and inspections to be performed whenever a car is on a shop or repair track. Although the AAR asserts that it did

away with the requirements to perform a set and release of the brakes and adjust piston travel on all cars on repair or shop tracks, the requirements are currently contained in power brake regulations separate and apart from any AAR requirements. See 49 CFR 232.17(a)(2)(ii), (iv). FRA believes that repair and shop tracks provide an ideal setting for railroads to conduct an individualized inspection on a car's brake system to ensure its proper operation and that such an inspection is necessary to reduce the potential of cars with excessive piston travel being overlooked when employees are performing the ordinary brake inspections required by this final rule. If any problems are detected at that location, the personnel needed to make any necessary corrections are already present. Furthermore, performing these inspections at this time ensures proper operation of the cars' brakes and eliminates the potential of having to cut cars out of an assembled train and, thus, should reduce inspection times and make for more efficient operations.

Paragraph (b) retains the proposed requirement that a car on a shop or repair track be tested to determine that its air brakes apply and remain applied until a release is initiated. This paragraph requires that the air brakes remain applied until the release signal is initiated and is intended to maintain consistency with the requirement contained in § 232.205(b)(4). Paragraph (b)(4) is an attempt to clarify language contained in the current regulation which require that the brakes "apply." This language has been misinterpreted by some to mean that if the piston applies in response to a command from a controlling locomotive or yard test device, and releases before the release signal is given, the brake system on that car is in compliance with the regulation because the brake simply applied. The intent of the regulation has always been that the brakes apply and remain applied until the release signal is initiated from the controlling locomotive or yard test device. Therefore, clarifying language was proposed in this paragraph to eliminate all doubt as to what is required. Consequently, this paragraph makes clear that the brakes on a car must remain applied until the appropriate release signal is given. If it fails to do so, the car must be repaired and retested.

Paragraph (c) retains the proposed requirement that if piston travel is found to be less than 7 inches or more than 9 inches, it must be adjusted to nominally 7½ inches, which is a change from the 7 inches as currently required,

in order to maintain consistency with the requirement proposed at § 232.205(b)(5). This change was proposed in the NPRM and is based on a request by AAR to change the adjustment to 7½ inches from 7 inches as its member railroads were finding it extremely difficult to adjust the piston travel to precisely 7 inches and that in some cases the adjustment would be marginally less than 7 inches, thus requiring a readjustment. Therefore, AAR sought the extra ½ inch in order to provide a small margin for error when the piston travel is adjusted. As FRA believes that AAR's concerns are validly placed and would have no impact on safety, FRA has accommodated the request.

Paragraph (d) retains the proposed listing of brake system components that are to be inspected prior to a car being released from a shop or repair track. Many of the items contained in this paragraph are currently required to be inspected pursuant to § 232.17(a)(2)(iv). It should be noted that the proposed requirement, retained in this final rule, regarding the proper functioning of angle cocks was modified in the NPRM from the existing requirement by clarifying that angle cocks must be inspected to ensure that they are properly positioned to allow maximum air flow. This is a clarification regarding the normal functioning of the angle cock, and should pose little, if any, additional inspection burden on the railroads. This paragraph adds two items to the inspections that are to be conducted when a car is on a shop or repair track. They are an inspection of a car's hand brake and an inspection of the accuracy and operation of any brake indicators on cars so equipped. As the final rule does not provide for the specific inspection of these items during any of the other required brake tests, FRA believes this is an ideal time for the railroad to inspect these items while imposing the least burden on the railroad's inspection and repair forces.

Paragraph (e) retains the proposed provisions permitting cars to be moved from a location where necessary repairs are made to a location where a single car or repair track air brake test can be performed if it cannot be performed at the same location where the repairs are conducted. FRA disagrees with the assertions of some commenters that air brake repairs should not be required at locations that lack the ability to perform single car or repair track air brake tests. FRA believes that position is not only contrary to the statutory mandates regarding the movement of equipment with defective brakes but would open the door to potential abuse by railroads.

Furthermore, the operation of a car's brake system can generally be tested after a repair without performing a complete repair track air brake test. For the most part, single car and repair track air brake tests are intended to be maintenance requirements that attach based on a condition in which a car is found or on a repair that is required to be performed. If the condition of a car is such that a repair track air brake test is necessary to determine the defect, then the final rule would permit movement of the car to the nearest location where a repair track air brake test can be performed. However, FRA believes that most defective conditions can be easily determined without performing a repair track air brake test. Moreover, for years FRA has required the performance of repairs where they can be performed and has allowed such equipment to be moved to the next forward location for performance of a single car or repair track air brake test and has not found that such a practice has created any potential safety hazard.

Paragraph (e) also retains the proposed requirements for tagging equipment which is being hauled for the performance of a single car or repair track air brake test after the appropriate repairs have been conducted. FRA believes that the tagging requirements are necessary not only to provide notice to a railroad's ground forces as to the presence of the car but also to ensure that railroads are properly performing the tests at appropriate locations. Furthermore, many railroads currently move equipment in this fashion, and there has been no indication that safety has been compromised. The final rule also retains the requirement that a copy or record of the tag be retained for 90 days and made available to FRA upon request. Contrary to the objections of some commenters, FRA continues to believe that the record keeping requirements are necessary so that there is accountability on the part of the railroads to conduct these tests at the proper locations and that equipment is not moved for extended periods without receiving its required maintenance. It should be noted that the final rule clarifies that the record or copy of the tag may be maintained either electronically or in writing provided all the required information is recorded. This paragraph retains the proposed alternative to the tagging requirements, which permits a railroad to utilize an automated tracking system to monitor these cars and ensure they receive the requisite tests as prescribed in this section provided the automated system is approved by FRA. It should be noted

that the final rule does not define or require identification of locations that can or will perform single car or repair track air brake tests as suggested by some commenters. FRA does not believe that such a requirement is necessary because the rule specifically establishes when the tests are to be performed and it is in the railroad's best interests to perform the tests in a timely manner.

Paragraph (f) contains the requirements for railroads to adequately track when single car or repair track air brake tests were last performed on a piece of equipment. This paragraph modifies the proposed requirements regarding the use of an automated tracking system in lieu of stenciling equipment with the date and location of the last single car or repair track test received. Since 1992, the industry has utilized the AAR's UMLER reporting system to electronically track the performance of single car and repair track air brake test as well as other repair information. Based on the performance and use of this system over the last seven years, FRA believes that the AAR's UMLER system has proven itself effective for tracking the information required in this paragraph and ensuring the timely performance of single car and repair track air brake tests. Furthermore, FRA continues to believe that the information required to be tracked in this paragraph with regard to these tests is easily maintained through an electronic medium. Moreover, FRA has found no substantiated instances of railroads falsifying or altering the information monitored and tracked by AAR's UMLER system. Thus, this paragraph permits railroads to utilize an electronic record keeping system to track single car and repair track air brake tests without obtaining prior FRA approval of the system. The final rule makes clear that FRA will monitor the performance of such systems and retains the right to revoke a railroad's authority to utilize the system if FRA finds that it is not properly secure, inaccessible to FRA or a railroad's employees, or fails to properly or adequately track and monitor the equipment.

*Section 232.305 Repair Track Air Brake Tests and Section 232.307 Single Car Tests*

These sections generally retain the proposed requirements related to the performance of single car and repair track air brake tests. Contrary to the assertions of some commenters, FRA continues to believe that certain maintenance procedures are critical to ensuring the safe and proper operation of the brake equipment on the nation's

fleet of freight cars. FRA does not believe that the determination of what maintenance should be performed should be left solely to the discretion of the railroads operating the equipment in all circumstances. As periodic COT&S maintenance has been eliminated and replaced with the performance of single car and repair track tests, which FRA agrees is a better and more comprehensive method of detecting defective brake equipment and components, FRA believes that specific and determinable limits must be placed on the manner and frequency of performing these tests. Therefore, these sections generally retain the proposed requirements regarding the performance of single car and repair track brake tests.

FRA recognizes that the procedures for performing single car and repair track tests proposed in the NPRM have been modified by the AAR since the issuance of the proposal. As it is FRA's intent to incorporate the most recent version of the single car and repair track air brake test procedures, paragraph (a) of each section incorporates by reference the test procedures that were issued by the AAR in April of 1999. These test procedures are contained in AAR standard S-486-99, Sections 3.0 and 4.0, which are located in the AAR's "Manual of Standards and Recommended Practices, Section E" (April 1999). Both these sections recognize that the industry may find it necessary to modify the test procedures from time to time in order to address new equipment or utilize new technology. Thus, paragraph (a) of each section permits railroads to seek approval of alternative procedures through the special approval process contained in § 232.17 of this final rule. The special approval process is intended to speed FRA's consideration of a party's request to utilize an alternative procedure from the ones identified in the rule itself. FRA believes that it is essential for FRA to approve any change made in the procedures for conducting these safety-critical tests in order to prevent unilateral changes and to ensure consistency in the method in which the tests are performed.

It should be noted that the incorporated procedures for performing single car and repair track air brake tests are the minimum requirements for performing such tests. The special approval process is required to be used only if the incorporated procedures are to be changed in some manner. For instance, if the industry were to elect to add a new test protocol to the incorporated procedures, there would be no need to seek approval of such an

addition as long as the procedures contained in the incorporated standard are still maintained. This final rule is not intended to prevent railroads from voluntarily adopting additional or more stringent maintenance standards provided they are consistent with the standards incorporated.

Both sections retain the proposed frequency at which single car and repair track air brake tests are to be performed. As noted in the preceding discussion, the primary intent of the proposed provisions was to codify the existing requirements regarding the performance of single car and repair track air brake tests and prevent any unilateral changes to those requirements. FRA believes that the frequency at which these tests are currently required to be performed under industry standards has proven to be sufficient and a substantial economic burden would be imposed if the frequency were increased. Both sections also retain the requirement that these tests be conducted by a qualified person. FRA continues to believe that the person performing these tests must be specifically trained and tested on how the test is to be performed and be able to determine the appropriate actions that must be taken based on the results of the test. FRA does not believe that the mere fact that a person is a carman or a QMI is sufficient to make that person qualified to perform single car or repair track air brake tests. FRA believes that the training and testing requirements required by this final rule ensures that a person is qualified to perform these tests.

Section 232.305(b) generally retains the proposed list of conditions that would require the performance of a repair track air brake test. However, two of the proposed conditions for when a repair track air brake test would be required to be performed have been slightly modified in order to make them consistent with the currently existing AAR requirements for performing these tests. FRA agrees that the proposed requirement to perform a repair track air brake test on any car removed from a train for a brake-related defect is overly restrictive and inconsistent with the requirements of AAR's Rule 3, Chart A. FRA agrees that the proposed requirement would require the performance of the test when minor brake system repairs are conducted, which is not the intent of the AAR's rule. Therefore, this paragraph modifies the proposed condition to require the performance of a repair track test on cars that have inoperative or cut-out air brakes when removed from a train. Furthermore, the proposed provisions requiring the performance of a repair

track air brake test whenever a car is found with a wheel with built-up tread or slid flat have been slightly modified. Under the final rule, the test will not be required if the built-up tread or slid flat wheel is known to have been caused by a hand brake that was left applied. These modifications are consistent with what is currently required under AAR Rule 3, Chart A.

Paragraphs (c) and (d) of § 232.305 retain the proposed requirements that each freight car receive a repair track air test within eight years from the date the car was built or rebuilt, and within every five years thereafter. FRA strongly believes that these minimum attention periods are sufficient to ensure the safety of the freight car fleet when considered in conjunction with the increased attention that freight cars receive when these types of tests are performed.

Paragraph (c) of § 232.307 retains the proposed requirement that a single car test be conducted by a qualified person prior to a new or rebuilt car being placed in or returned to revenue service. FRA believes that it is essential for new and rebuilt cars to receive this test prior to being placed in revenue service in order to ensure the proper operation of the brake system on the vehicle. Most railroads already require this attention to be given to new and rebuilt cars; thus, the cost of this requirement is minimal and merely incorporates the best practices currently in place in the industry.

#### *Section 232.309 Repair Track Test and Single Car Test Equipment and Devices*

This section generally retains the proposed requirements for maintaining the equipment and devices used in performing repair track and single car air brake tests. This section modifies some of the proposed provisions regarding the testing and calibration of single car test devices and other mechanical devices used to perform single car and repair track air brake tests. FRA's intent when proposing the requirements contained in this section was to codify the current best practices of the industry. Thus, FRA did not intend to propose testing and calibration requirements that were more stringent than those currently imposed by AAR standards. Therefore, FRA agrees with the comments submitted by AAR that the testing and calibration requirements for single car test devices should not be imposed until the devices are actually placed in service, which is consistent with current AAR requirements. FRA recognizes that the proposed calibration and testing requirements may have

resulted in the unnecessary acquisition of single car testing devices. Consequently, this section has been modified to clarify that the 92-day and the 365-day calibration and testing requirements related to single car test devices are to be calculated from the day on which the device is first placed in service. FRA continues to believe that the devices and equipment used to perform these single car and repair track air brake tests are safety-critical items. Consequently, FRA believes that these devices must be kept accurate and functioning properly in order to ensure that repair track and single car tests are properly performed.

#### **Subpart E—End-of-Train Devices**

This subpart incorporates the design, performance, and testing requirements relating to end-of-train devices (EOTs) that were issued on January 2, 1997, which became effective for all railroads on July 1, 1997, except for those for which the effective date was extended to December 1, 1997 by notice issued on June 4, 1997. *See* 62 FR 278 and 62 FR 30461. This subpart also incorporates the recent modifications made to the two-way EOT requirements to clarify the applicability of the requirements to certain passenger train operations where multiple units of freight-type equipment, material handling cars, or express cars are part of a passenger train's consist. *See* 63 FR 24130.

As noted in the discussion of the applicability provisions contained in § 232.3 of this final rule, this subpart applies to all trains unless specifically excepted by the provisions contained in this subpart. As the provisions contained in this subpart were just recently issued, there is little need to discuss these requirements in detail as they were fully discussed in the publications noted above. However, after their issuance, FRA discovered that a few of the provisions were in need of minor modification for clarification purposes and to address some valid concerns that have been raised both internally by FRA inspectors and by outside parties. Consequently, in the NPRM FRA proposed various changes to the provisions related to end-of-train devices and discussed other issues which might require modification of the existing provisions. *See* 63 FR 48347–49. This discussion is intended to focus on the proposed changes and address those issues discussed in the preamble to the NPRM as well as address the issues raised at the public hearings and in written comments.

*Section 232.405 Design and Performance Standards for Two-Way End-of-Train Devices*

Paragraph (d) retains the proposed modification of the requirement relating to the diameter of the valve opening and hose on two-way EOTs, which is currently contained in § 232.21(d). The current regulation requires that the valve opening and hose have a minimum diameter of  $\frac{3}{4}$  inch to effect an emergency application. FRA has discovered that sometime prior to the issuance of the final rule on two-way EOTs, Pulse Electronics began manufacturing its two-way EOT with the internal diameter of the hose being  $\frac{5}{8}$  inch. Testing of the devices manufactured with these smaller diameter hoses showed that they met all criteria for emergency application capability based on standards and guidelines set forth by the AAR. Furthermore, testing of the devices at the Westinghouse facility in Wilmerding, Pennsylvania, demonstrated that the  $\frac{5}{8}$  inch diameter hose permitted 14 consecutive 50-foot cars with cut-out control valves or 750 feet of brake pipe to be jumped. This is more than double the AAR standard for control valve requirements. Moreover, FRA's intent when issuing the two-way EOT design requirements was to incorporate designs that existed at the time the rule became effective. Consequently, paragraph (d) of this section is modified to permit the use of a  $\frac{5}{8}$  inch internal diameter hose in the design of the devices.

Paragraph (e) has been slightly modified, from what is currently required in § 232.21(e), to permit the manually operated switch capable of initiating an emergency brake command to the rear unit to be located either on the front unit itself or on the engineer control stand. Several railroads and a manufacturer of locomotives recommended that the provision regarding the placement of the manually operated switch be modified to recognize existing designs of the devices and the locomotives on which they are placed. These commenters stated that many front units do not have the switch located directly on the front unit itself but that the switch is located on the engineer's control stand. FRA agrees with this recommendation and currently does not take exception to locomotives designed in the manner described above. Consequently, this paragraph permits the manually operated switch to be located either on the front unit itself or on the engineer's control stand.

A new paragraph (f) has been added to this section which incorporates a

recommendation from AAR and its member railroads that new locomotives be equipped with a means to automatically activate an emergency brake application from the rear unit whenever the locomotive engineer places the train air brakes in emergency. On June 1, 1998, FRA issued Safety Advisory 98-2, which recommended that railroads adopt a procedure to require activation of the rear unit to effectuate an emergency brake application either by using the manual toggle switch or through automatic activation, whenever it becomes necessary for a locomotive engineer to place the train air brakes in emergency using either the automatic brake valve or the conductor's emergency brake valve or whenever an undesired emergency application of the train air brakes occurs. See 63 FR 30808. FRA applauds the industry for taking the initiative to incorporate available technology on new locomotives and agrees with the representatives of the railroads that it is not economically feasible to require existing equipment to be retrofitted with this capability at this time. Furthermore, existing equipment is addressed in § 232.407(f)(3), which retains the proposed requirement for the engineer to manually activate an emergency application from the rear unit when the engineer initiates an emergency application in the controlling locomotive if the locomotive is not equipped to do so automatically.

FRA issued Safety Advisory 98-2 in response to several recent freight train incidents potentially involving the improper use of a train's air brakes, events that caused FRA to focus on railroad air brake and train handling procedures related to the initiation of an emergency air brake application, particularly as they pertain to the activation of the two-way EOT from the locomotive. The NPRM discussed four accidents in which a train was placed into emergency braking by use of the normal emergency brake valve handles on the locomotive, and although the train in each instance was equipped with an armed and operable two-way EOT, the device was not activated by the locomotive engineer. See 63 FR 48348. Preliminary findings indicate that in all of the incidents noted above, there was evidence of an obstruction somewhere in the train line, caused by either a closed or partially closed angle cock or a kinked air hose. This obstruction prevented an emergency brake application from being propagated throughout the entire train, front to rear, after such an application was initiated from the locomotive using either the

engineer's automatic brake valve handle or the conductor's emergency brake valve. Furthermore, the locomotive engineers in each of the incidents stated that they did not think to use the two-way EOT, when asked why they failed to activate the device.

*Section 232.407 Operations Requiring Use of Two-Way End-of-Train Devices; Prohibition on Purchase of Nonconforming Devices*

Paragraph (e) generally retains the proposed modification of the provision, currently contained in § 232.23(e)(1), which exempts from the two-way EOT requirements trains operating with a locomotive capable of effectuating an emergency application located in the rear third of the train. In the NPRM, FRA proposed to modify this exception so that it would be applicable only to trains operating with a locomotive on the rear of the train. Data supplied by VOLPE demonstrates that stopping distances are greatly increased, and could potentially result in a runaway train or derailment depending on the length of the train, if an obstruction of the brake pipe were to occur directly behind a locomotive located in the rear third of the train. Therefore, FRA proposed that a train with a locomotive located in the rear third of the consist no longer be excepted from the two-way EOT requirements, unless the train qualifies for relief under one of the other specific exceptions contained in § 232.407(e). Although FRA received no objections to this specific change, several commenters did recommend that the exception contained in paragraph (e)(1) be modified to include locomotive consists at the rear of a train. These commenters asserted that the existing rule needed to recognize that some locomotives have fuel tenders attached. FRA finds this requested modification to be sensible and logical. Consequently, paragraph (e)(1) has been retained as proposed, with a slight modification to clarify that the exception extends to trains with either a locomotive or a locomotive consist located at the rear of the train.

A new exception to the two-way EOT requirements has been added at paragraph (e)(9) to address the practice of "doubling a hill." The practice of "doubling a hill" occurs in situations where a train must be divided in two in order to traverse a particularly heavy grade due to the lack of sufficient motive power to haul the entire train up the grade. This issue was discussed in the NPRM and at the public technical conference conducted subsequent to the issuance of the NPRM. Initially, FRA believed that the two-way EOT should

be connected to that portion of the train traversing the grade. However, such an approach creates a multitude of operational as well as safety concerns. Such an approach would require train crews to repeatedly switch the rear unit from one portion of the train to another, which would require these individuals to repeatedly walk sections of the train at locations where it may not be safe to do so. Alternatively, such an approach might require some trains to carry extra devices while in transit. At the public technical conference, there was universal agreement between all representatives at the conference that the device should remain on the rear unit of the train in these circumstances. Consequently, paragraph (e)(9) has been added to except trains from the two-way EOT requirements that must be divided into two sections in order to traverse a grade. This paragraph makes clear that the exception only applies to the extent necessary to traverse the grade and only while the train is divided into two to conduct that movement.

Paragraph (f)(1) has been slightly modified from what is currently contained § 232.23(f)(1) in order to clarify and address an issue related to the ability of a railroad to dispatch a train with an inoperative two-way EOT from a location where the device is installed. Section 232.23(f)(1) of the current regulations, § 232.407(f)(1) of the NPRM, requires that "the device shall be armed and operable from the time the train departs from the point where the device is installed until the train reaches its destination." Therefore, the existing regulations clearly require a train to be equipped with an armed and operable two-way EOT when dispatched from a location where the device is installed. When issuing this requirement, FRA intended railroads to install repeater stations at locations where communication problems are prevalent.

Several commenters, both at the public hearings and in written comments, assert that this requirement is impossible to meet at some locations regardless of whether repeater stations are installed. These commenters contend that certain locations have dead spots where it is impossible to establish communication between the front and rear unit. These parties recommend that some allowance be provided to permit trains at these locations to be moved a short distance to restore communication. FRA agrees that there are a few locations where dead spots exist which make it difficult if not impossible to establish communication between the two units when they are installed. Therefore, paragraph (f)(1) has

been modified to allow a train that experiences a loss of communication or that fails to establish communication between the two units at the location where the device is installed to move up to one mile from that location in order to establish communication. FRA believes that this allowance should be sufficient at most locations to establish the required communication.

Furthermore, if communication cannot be established within these limits, then FRA believes the railroad needs to install additional repeater stations. If additional repeater stations still fail to address the issue, then FRA believes that a railroad should be required to apply for a waiver of the requirement at a particular location, pursuant to the requirements of 49 CFR part 211. This approach will allow FRA to address the unique circumstances of each location on a case-by-case basis and ensure that the railroad implements other operational safeguards to ensure the safety of those trains dispatched without armed and operable devices.

Paragraph (f)(3) generally retains the proposed provision requiring the two-way EOT to be activated to effectuate an emergency brake application either by using the manual toggle switch or through automatic activation, whenever it becomes necessary for the locomotive engineer to initiate an emergency application of the train's air brakes using either the automatic brake valve or the conductor's emergency brake valve. As discussed previously in regard to the addition of § 232.405(f), the proposed requirement incorporates the recommendations contained in FRA's Safety Advisory 98-2, issued on June 1, 1998. *See* 63 FR 30808. FRA believes that the operational requirement contained in this paragraph must be stressed by the railroads when conducting the two-way EOT training required in § 232.203 of this final rule. FRA continues to believe that the likelihood of future incidents, such as the ones described in the NPRM, will be greatly reduced if the train handling procedure contained in this paragraph is made part of a train crew's training and followed by members of the crew in emergency situations. FRA believes that this additional procedure, together with the required training, will not only ensure that an emergency brake application is commenced from both the front and rear of the train in emergency situations, but will familiarize the engineer with the activation and operation of the devices and will educate the engineer to react in the safest possible manner whenever

circumstances require the initiation of an emergency brake application.

FRA recognizes that a number of railroads have already adopted procedures similar to those required in this paragraph and commends such actions. Although this paragraph allows the device to be activated either manually or automatically, FRA intends to make clear that the front unit of the device or the engineer's control stand must be equipped with a manually operated switch. *See* § 232.405(e). Although some railroads have developed, and this final rule requires, new locomotives to be equipped with a means by which the rear unit is automatically activated when an engineer makes an emergency application with the brake handle, FRA believes that an engineer must also be provided a separate, manually operated switch which is independent of any automatic system in order to ensure the activation of the rear unit in the event that the automatic system fails.

It should be noted that the provision contained in paragraph (f)(3) has been slightly modified from that proposed in the NPRM. This final rule has eliminated the requirement to activate the rear unit when an undesired emergency brake application occurs to a train. FRA agrees with the assertions of various commenters that such a requirement might distract a locomotive engineer from performing other critical duties required to bring a train to a stop when an undesired emergency brake application occurs. As an undesired emergency brake application is not initiated by the locomotive engineer, such an event will usually take the engineer by surprise, and FRA agrees that the engineer's attention would be best focused on the activity of bringing the train to a stop in such circumstances. Furthermore, all of the instances where an engineer failed to activate the rear device that were discussed in the NPRM occurred in conjunction with an emergency brake application knowingly initiated by the engineer.

Based on the above discussion regarding paragraph (e)(1) of this section, paragraph (g)(1) retains the proposed modification of the requirements for operating a train that experiences an en route failure of the two-way EOT over a section of track with an average grade of two percent or greater over a distance of two continuous miles. In the NPRM, FRA proposed modification of the alternative measure, currently contained at § 232.23(g)(1)(iii), which permits the operation over such a grade if a radio-controlled locomotive is placed in the

rear third of the train consist and under the continuous control of the engineer in the head end of the train. FRA proposed modification of this alternative measure to permit such operation only if the radio-controlled locomotive is placed at the rear of the train consist. This modification is retained in this final rule in order that the alternative methods of operation over a heavy grade remain consistent with the exception from the two-way EOT requirements contained in § 232.407(e)(1) as discussed in the preceding paragraph. Although some commenters suggested elimination of all of the requirements related to operating a train experiencing an en route failure of its two-way EOT over heavy grades, FRA believes that the alternative methods are necessary to ensure the safety of such a train when descending a heavy grade and ensure that railroads properly maintain the required devices.

Paragraphs (g)(1)(i)(A) and (B) have also been slightly modified to clarify the requirements that a train be stopped in certain situations where communication is lost between a helper locomotive and the controlling locomotive. The final rule makes clear that the stopping of trains in such circumstances should be in accordance with the railroad's operating rules. When issuing the two-way EOT requirements, FRA did not intend for engineers to place themselves in unsafe situations when they encounter an en route failure of the device when traversing a heavy grade. Although the existing rule prohibits the operation of a train over certain heavy grades when a failure of the device occurs en route, FRA did not intend that the train be immediately stopped when a failure of the device occurs while operating on a heavy grade. Rather, FRA intended for the locomotive engineer to conduct the movement in accordance with the railroad's operating rules for bringing the train safely to a stop at the first available location. Therefore, safety may require that the train continue down the grade or to a specific siding rather than come to an immediate halt. Consequently, the modifications contained in these paragraphs are intended to reflect FRA's expectations when issuing the two-way EOT regulations.

Paragraph (g) has also been slightly modified in order to clarify what constitutes a loss of communication between the front and the rear units on two-way EOTs. The 16 minutes 30 seconds time period for determining when a loss of communication between the front and the rear unit was adopted based on the design of the devices, which automatically checks

communication between the front and rear units every ten minutes. If no response is received, the front unit automatically requests communication from the rear unit 15 seconds later; if no response is received to that request, another request is made six minutes later; and if there is still no response, the front unit makes another request 15 seconds later. If there is still no response, a message is displayed to the locomotive engineer that there is a communication failure. This has caused some confusion in the industry, in that many people believe the 16 minutes and 30 seconds time frame should start when the message is first displayed on the front unit. This is incorrect. Based on the design of the currently operating devices, the 16 minutes and 30 seconds has elapsed when the failure message is broadcast. This paragraph has been modified to explain this design feature. Thus, appropriate action should be taken immediately upon receiving the failure message on the front unit. FRA also realizes that there may be some time lapse when the requests are made and the message is displayed, therefore the manufacturers of the devices should take care to factor any time lag into the 16 minute and 30 second time frame designed into the devices.

#### *Section 232.409 Inspection and Testing of End-of-Train Devices*

Paragraph (c) of this section regarding the notification of the locomotive engineer when the device is tested by someone other than a train crew member has been slightly modified from that proposed in the NPRM. In the NPRM, FRA proposed that the locomotive engineer be notified in writing in such circumstances. FRA agrees that this proposed requirement may have been overly burdensome and believes that the intent of the proposed requirement can be met without specifically requiring written notification. FRA's intent in proposing the written requirement was to ensure that locomotive engineers are provided sufficient information to confirm that the devices are properly inspected and tested and to provide locomotive engineers with a measure of confidence that the devices will work as intended. FRA believes these goals can be accomplished by permitting the required information to be provided by any means a railroad deems appropriate. FRA believes that the information required to be provided to an engineer (the date and time of the test, the location where the test was performed, and the name of the person performing the test) will ensure that the proper tests and inspections are performed. The

modifications made in this paragraph make clear that a written or electronic record of the required information must be maintained in the cab of the controlling locomotive.

Paragraph (d) retains the proposed changes to the language related to the annual calibration and testing of EOT devices currently contained at § 232.25(d). The regulation currently states that the devices shall be "calibrated" annually. FRA intends to make clear that it intended for railroads to perform whatever tests or checks are necessary to ensure that the devices are operating within the parameters established by the manufacturers of the devices. Several railroads have attempted to "sharp shoot," or narrowly interpret, the language currently contained in the regulation, claiming that the manufacturer states that front units do not need to be calibrated on an annual basis, in order to avoid doing any testing of the devices. Although FRA agrees that the front units may not have to be calibrated every year, the devices must be tested in some fashion to verify that they are operating within the manufacturer's specification with regard to radio frequency, signal strength, and modulation and do not require recalibration. FRA has been provided written instructions from the manufacturers of the devices which contain procedures for testing both the front and rear units. Furthermore, railroads using the devices in Canada acknowledge that the radio functions of the front and rear units are tested periodically. Consequently, this paragraph retains the proposed clarifying language in order to avoid any misconceptions as to what actions are required to be performed on these devices on an annual basis.

Paragraph (d) has also been slightly modified to require the ready accessibility of the information regarding the calibration and testing of a front unit, which the current regulation requires to be placed on a sticker or other marking device affixed to the exterior of the front unit. Recently, FRA has discovered that some railroads have locked the cabinets that house the front units and that there is no way for either FRA or railroad operating crews to inspect the marking devices and verify the information required to be maintained. In order for the marking device to serve its intended purpose, it must be readily capable of being inspected by both FRA and railroad operating crews. FRA intends to make clear that the required information regarding the date and location that the unit was last calibrated is to be easily accessible to both FRA and train crews

for inspection either on the marking device attached to the outside of the front unit or, if the front unit is inaccessible, in a readily accessible location in the cab of the locomotive.

In the NPRM, FRA discussed the potential need to amend paragraph (c) of this section by including specific provisions in this final rule to address the performance of bench testing on the front and rear units of two-way EOTs. See 63 FR 48322. After consideration of the comments received, FRA believes that specific regulatory requirements for performing these tests are unnecessary. FRA believes that its existing guidance, FRA Technical Bulletin MP&E 97-8, regarding the performance of bench tests on two-way EOTs is sufficient at this time. Since the issuance of this guidance on July 28, 1997, FRA has discovered very few instances where the issued guidance was not being followed and has found no evidence indicating that bench tests have compromised the proper operation of the devices. Consequently, FRA will not issue specific regulations regarding the performance of bench test at this time. However, FRA will continue to monitor the performance of these tests and will continue to expect railroads to perform the tests in accordance with the guidance previously issued by FRA.

FRA issued Technical Bulletin MP&E 97-8 to its inspectors to clarify what is required when a railroad performs a bench test. In this guidance, FRA made clear that a bench test may be performed on both the front and rear units, independent of each other, if the test is performed within the yard limits or location where the unit will be installed on the train. In FRA's view, bench testing the rear unit requires applying air pressure to the device and then transmitting an emergency brake application from a front unit using the front unit manual switch; the individual performing the test would determine that the emergency valve functions properly either by observing the emergency indicator pop out or by observing brake pipe pressure at the rear device go to zero while hearing the exhaust of air from the device. On the other hand, bench testing the front unit would entail transmitting an emergency brake application from the front unit, using the front unit manual switch, and observing that a rear unit successfully receives the signal and activates the emergency air valve.

The guidance also indicated that both tests must be performed within a reasonable time period prior to the device being armed and placed on the train. To determine a reasonable time period, the environment where the

device is stored and the conditions the device is subjected to after completing a successful bench test have to be considered. If the device is tested and stored in a controlled environment that is free from weather elements, excessive dust, grease, and dirt prior to the immediate installation on a train, then four to eight hours would be acceptable. If the device is tested and haphazardly thrown into a corner of a shop or are placed in the rear of a truck to be bounced around a yard, one hour would likely be considered reasonable before installation. The guidance also made clear that bench tests must be performed at the location or yard where the device will be installed on a train.

#### **Subpart F—Introduction of New Brake System Technology**

This subpart retains, without change, the proposed tests and procedures required to introduce new train brake system technology into revenue service. The technology necessary for the introduction of advanced braking systems is quickly developing. The new technology includes various forms of electronic braking systems, a variety of braking sensors, and computer-controlled braking systems. In order to allow and encourage the development of new technology, this subpart establishes tests and procedures for introducing new brake system technology. These provisions require the submission to FRA of a pre-revenue service acceptance testing plan.

FRA intends to make clear that this subpart applies only to new train brake system technology that complies with the statutory mandates contained in 49 U.S.C. 20102, 20301-20304, 20701-20703, 21302, and 21304, but that is not specifically covered by this final rule. Any type of new train brake system that requires an exemption from the Federal railroad safety laws in order to be operated in revenue service may not be introduced into service pursuant to this section. In order to grant a waiver of the Federal railroad safety laws, FRA is limited by the specific statutory provisions contained in 49 U.S.C. 20306 as well as any FRA procedural requirements contained in this chapter.

#### *Section 232.503 Process to Introduce New Brake System Technology*

This section retains the proposed procedural requirements which must be met when a railroad intends to introduce new brake system technology into its system. This section makes clear that the approval of FRA's Associate Administrator for Safety must be obtained by a railroad prior to the railroad's implementation of a pre-

revenue service acceptance test plan and before introduction of new brake system technology into revenue service. This section requires that such approval be obtained pursuant to the special approval process contained in § 232.17 of this final rule. FRA believes the special approval process should speed the process for taking advantage of new technologies over that which is currently available under the waiver process. However, in order to provide an opportunity for all interested parties to provide comment for use by FRA in its decision making process, as required by the Administrative Procedure Act, FRA believes that any special approval provision must, at a minimum, provide proper notice to the public of any significant change or action being considered by the agency with regard to existing regulations.

#### *Section 232.505 Pre-Revenue Service Acceptance Testing Plan*

This section retains the proposed requirements for pre-revenue service testing of new brake system technology. These tests are extremely important in that they are intended to prove that the new brake system can be operated safely in its intended environment. For equipment that has not previously been used in revenue service in the United States, paragraph (a) requires the operating railroad to develop a pre-revenue service acceptance testing plan and obtain FRA approval of the plan under the procedures stated in § 238.17 before beginning testing. Previous testing of the equipment at the Transportation Test Center, on another railroad, or elsewhere will be considered by FRA in approving the test plan. Paragraph (b) requires the railroad to fully execute the tests required by the plan, to correct any safety deficiencies identified by FRA, and to obtain FRA's approval to place the equipment in revenue service prior to introducing the equipment in revenue service. Paragraph (c) requires the railroad to comply with any operational limitations imposed by FRA. Paragraph (d) requires the railroad to make the plan available to FRA for inspection and copying. Paragraph (e) enumerates the elements that must be included in the plan. FRA believes this set of steps and the documentation required by this section are necessary to ensure that all safety risks have been reduced to a level that permits the new brake system technology to be used in revenue service. In lieu of the requirements of paragraphs (a) through (e), paragraph (f) provides for an abbreviated testing procedure for new brake system technology that has previously been

used in revenue service in the United States. The railroad need not submit a test plan to FRA; however, a description of the testing shall be maintained by the railroad and made available to FRA for inspection and copying.

**IV. Regulatory Evaluation**

*A. Executive Order 12866 and DOT Regulatory Policies and Procedures*

This final rule has been evaluated in accordance with existing policies and procedures and is considered to be significant under both Executive Order 12866 and DOT policies and procedures (44 FR 11034; Feb. 26, 1979). FRA has prepared and placed in the docket a regulatory evaluation of this final rule. This evaluation estimates the costs and consequences of this final rule as well as its anticipated economic and safety benefits. It may be inspected and photocopied during normal business hours by visiting the FRA Docket Clerk at the Office of Chief Counsel, FRA, Seventh Floor, 1120 Vermont Avenue, NW., in Washington, DC. Photocopies may also be obtained by submitting a written request by mail to the FRA Docket Clerk at the Office of Chief Counsel, Federal Railroad Administration, 1120 Vermont Avenue, NW., Mail Stop 10, Washington, DC 20590.

FRA believes that this rule will produce net benefits to society. The estimated Net Present Value (NPV) of the total 20-year costs associated with this final rule is approximately \$109 million. The total 20-year benefits (safety and economic) consist of quantified benefits estimated at between approximately \$112 and \$130 million and various non-quantified benefits discussed in detail below. The following tables contain the estimated 20-year quantified costs and quantified benefits associated with this final rule.

**TABLE 3.—ESTIMATED COSTS**

Category	NPV costs
Training .....	\$61,221,156
Retest .....	8,276,574
Piston Travel Stickers .....	3,385,681
Air Quality .....	1,819,214
Dynamic Brake .....	11,657,846
Cycle Trains .....	16,012,217
Class I Brake Test Notification .....	4,414,173
Helper Locomotive Inspection .....	1,929,071
Helper Link .....	164,933
<b>Total .....</b>	<b>108,880,865</b>

**TABLE 4.—ESTIMATED BENEFITS**

Category	NPV benefits
Extended Haul .....	\$29,590,556— \$46,735,494 57,460,452
Safety Improvements .....	
EOT Use at Class I Brake Test .....	22,070,863
Bottom Rod Safety Supports .....	3,239,650
<b>Total .....</b>	<b>112,361,521— 129,506,459</b>

Although the quantified benefits of this final rule exceed the quantified costs of the rule, FRA believes that the quantified benefits significantly underestimate the total benefits of this rule for several reasons. The information available to FRA on the value of property damage significantly understates the true value of the damage in railroad accidents. The property damage estimate provided by the railroad(s) in the aftermath of an accident are only for “railroad property damage” (equipment, track, and structures). Although the numbers provided by the railroads regarding railroad property damage have been enhanced to account for chronic underestimation of these damages, the figures used by FRA do not include the costs of evacuations, individual (non-railroad employee) or community health expenses, environmental cleanup, the closure of adjacent roads, or any of the other potential costs which are borne by society after a railroad accident.

A review of recent incidents that involve a train that loses its ability to stop or decrease speed show that there is a significant risk that such an occurrence could result in the release of large amounts of hazardous materials which, if the incident occurred in a densely populated or environmentally sensitive area, could produce truly catastrophic results. The costs of evacuation and medical treatment for those near the accident site could be substantial, and associated road closures could also produce significant economic impact to travelers and the communities nearby. Should a hazardous material release impact a river or stream, the consequences to wildlife in the area could also be severe and lasting. Furthermore, because derailments or collisions of trains which lose the ability to stop or decrease speed often occur due to overturning on curves or entering congested areas, third party casualties and property damage can also be substantial. As the inspection, testing, and maintenance provisions of this final rule are intended to ensure that the brakes on a train are effective

and operable and because this final rule will ensure that a locomotive engineer is provided information regarding the condition of the brakes on the train they are operating, FRA believes that this final rule will reduce the number of instances where a train loses its ability to stop or decrease speed that create the potential for catastrophic consequences.

An example of the catastrophic consequences that could result when a freight train loses the ability to stop or decrease speed occurred on February 1, 1996, in Cajon Pass in California. This accident resulted in two fatalities, 32 injuries (32 emergency responders required medical treatment due to inhalation of toxic chemicals), the release of hazardous materials, and the subsequent evacuation of the surrounding area. In addition, a 20 mile segment of Interstate 15, the main route between Los Angeles and Las Vegas, was closed for 5 days as a result of the hazardous materials release. The road closure forced 89,000 vehicles a day to use detours. This added approximately 2 hours to the travel time between Las Vegas and Los Angeles. The losses to the surface transportation sector due to road and track closure, revenue losses to businesses and tourism, and the costs of emergency response related to this incident were not included in the estimated \$15 million damage figure used by FRA when including this incident in the regulatory impact analysis of the two-way end-of-train device final rule. See 62 FR 291. FRA recognizes that an exact figure cannot be placed on these costs, but believes that the figure would be in the tens, if not hundreds, of millions of dollars. As devastating and costly as this incident was, it is probable that the results of this particular incident could have been much more disastrous. An Amtrak passenger train passed 17 minutes ahead of the train involved in the incident. Had the Amtrak train been stopped on the tracks or otherwise delayed, the consequences of the incident would have been much more severe, with the potential for scores of fatalities. (As illustration of potential consequences, a freight-to-passenger train collision at Hinton, Alberta, on February 8, 1986, resulted in 29 fatalities.)

Other power-brake related accidents illustrate the potential for high severity when a heavy-tonnage freight train loses braking control. On May 12, 1989, a Southern Pacific Transportation Company train accelerated out of control descending a 2.2 percent grade into San Bernardino, California. Two employees were killed and three injured. The entire train was effectively

destroyed. The incident destroyed seven residences adjacent to the right-of-way, killing two residents and injuring a third. A 14-inch gasoline pipeline which may have been damaged in either the incident or the ensuing clean-up, ruptured 13 days later, resulting in the death of two additional residents, serious injuries to two residents, and minor injuries to 16 others. Eleven additional homes were destroyed, along with 21 motor vehicles.

On February 2, 1989, near Helena, Montana, freight cars from a Montana Rail Link train rolled eastward down a mountain grade and struck a helper locomotive consist, slightly injuring two crewmembers. Hazardous materials in the consist which included hydrogen peroxide, isopropyl alcohol, and acetone were later released. The release of these hazardous materials resulted in a fire and explosions necessitating the evacuation of approximately 3,500 residents of Helena for over two days. According to the National Transportation Safety Board, railroad and other property damage alone exceeded \$6 million, and all of the buildings of Carroll College sustained damage. Furthermore, the City of Helena received 154 reports of property damage from residents within a three-mile radius of the incident. Consequently, FRA believes that the potential unquantified benefits derived from the prevention of just one accident similar to the Cajon Pass incident or the other incidents noted above would most likely outweigh the potential costs of this final rule.

In addition to the potential underestimation of the quantified safety benefits, there may also be significant non-quantified business benefits that may be available as a consequence of this rule. The quantified benefits from the extended haul provisions may be significantly understated. FRA's estimates for the number of trains eligible for this benefit, and the cost saving that it produces, were much higher in the NPRM than those supplied by AAR in response to the NPRM. While we have used the figures provided by AAR to develop a range for the benefits related to the extended haul provisions, FRA continues to believe that more potential benefits are available to the industry than have been quantified in the Regulatory Impact Analysis.

Another business benefit for which FRA has insufficient information to form a credible estimate relates to the provision permitting previously tested cars to be added to trains received in interchange and the allowance to conduct a Class II brakes test on only those cars added to trains received in

interchange that will move less than 20 miles from the interchange location. Under the existing regulations the addition of cars to such trains would require the performance of either an initial terminal brake test or a transfer train brake test on the entire train. The industry may realize substantial cost savings by being permitted to add cars to such trains without inspection of the entire train. By permitting the addition of cars to trains received in interchange, FRA allows the railroads to save significant time (labor and train delay costs) by not having to inspect the entire train consist when such cars are added to these trains. Because FRA does not have information on the number of interchanged trains engaging in such activity (and none were provided in response to the NPRM), we have not estimated the extent of this potential benefit. Actual business benefits to be realized due to this rule, therefore, may be significantly understated.

Moreover, Congress mandated that FRA review and revise the existing power brake regulations where necessary and specifically required that FRA prescribe standards regarding dynamic brakes, where applicable. Consequently, FRA believes that this final rule produces a net benefit to society. The costs that have been quantified represent the maximum that this rule is expected to cost, and the quantified projected benefits are the minimum which should be realized.

#### B. Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 *et seq.*) requires an assessment of the impacts of proposed and final rules on small entities. FRA has conducted a regulatory flexibility analysis of this rule's impact on small entities, and the assessment has been placed in the public docket for this rulemaking.

#### 1. Why Action By the Agency Is Being Considered

In 1992, Congress amended the Federal rail safety laws by adding certain statutory mandates related to power brake safety. See 49 U.S.C. 20141. These amendments specifically address the revision of the power brake regulations by adding a new subsection which states:

(r) POWER BRAKE SAFETY.—(1) The Secretary shall conduct a review of the Department of Transportation's rules with respect to railroad power brakes, and not later than December 31, 1993, shall revise such rules based on such safety data as may be presented during that review.

(2) In carrying out paragraph (1), the Secretary shall, where applicable, prescribe

standards regarding dynamic brake equipment. \* \* \* Pub. L. No. 102-365, section 7; codified at 49 U.S.C. 20141, superseding 45 U.S.C. 431(r).

In addition to this statutory mandate, FRA received various recommendations and petitions for rulemaking, and determined on its own that the power brake regulations were in need of revision. FRA has been in the process of revising the power brake regulations since 1992. An ANPRM and two NPRMs revising the power brake regulations were previously issued on December 31, 1992, September 16, 1994, and September 9, 1998, respectively. See 57 FR 62546, 59 FR 47676, and 63 FR 48294. A detailed discussion of the history leading up to this final rule is contained in the preamble. The reasons for the actual provisions of the action considered by the agency are explained in the body of the preamble and the section-by-section analysis.

#### 2. The Objectives and Legal Basis for the Rule

The objective of the rule is to enhance the safety of rail transportation, protecting both those people traveling and working on the system, and those people off the system who might be affected by a rail incident by revising the regulations related to the braking systems used and operated in freight and other non-passenger trains to address potential deficiencies in the existing regulations, better address the needs of contemporary railroad operations, and facilitate the use of advanced technologies. The legal basis for this action is reflected in the response to 1. above and in the preamble.

#### 3. A Description of and an Estimate of the Number of Small Entities to Which the Final Rule Would Apply

The Small Business Administration (SBA) uses an industry wide definition of "small entity" based on employment. Railroads are considered small by SBA definition if they employ fewer than 1,500 people for line haul railroads, and 500 for switching and terminal railroads. An agency may establish one or more other definitions of this term, in consultation with the SBA and after an opportunity for public comment, that are appropriate to the agency's activities.

The classification system used in this analysis is that of the FRA. Prior to the SBA regulations establishing size categories, the Interstate Commerce Commission (ICC) developed a classification system for freight railroads as Class I, II, or III, based on annual operating revenue. A Class I railroad has

operating revenue of \$250 million or more, a Class II railroad has operating revenue greater than \$20 million dollars but less than \$250 million and a Class III railroad has operating revenue of \$20 million or less. The Department of Transportation's Surface Transportation Board, which succeeded the ICC, has not changed these classifications. The ICC/STB classification system has been used pervasively by FRA and the railroad industry to identify entities by size. In the NPRM, FRA discussed these revenue thresholds in terms of the revenue levels actually achieved by these different classes of railroads rather than by the specific limits established in the Surface Transportation Board's regulations. See 49 CFR part 1201 1-1.

After consultation with the Office of Advocacy of the SBA and as explained in detail in the "Interim Policy Statement Concerning Small Entities Subject to the Railroad Safety Laws," published August 11, 1997 at 62 FR 43024, FRA has decided to define "small entity," on an interim basis, to include only those entities whose revenues would bring them within the Class III definition. In response to FRA's request for comments on its alternate definition, the American Short Line and Regional Railroad Association (ASLRRA) suggested that the definition include all Class II and Class III railroads. However, the ASLRRA offered no support for this request nor provided any rationale for why such a large number of railroads should be considered "small entities." Consequently, this final rule retains the alternate definition of "small entity" which includes only Class III railroads.

All of the small entities directly affected by this rule are Class III railroads. FRA certifies that this final rule is expected to have a significant impact on a substantial number of Class III railroads. Although FRA did not quantify the estimated annual cost or benefit to the average Class III railroad (of which there are approximately 600-650 at any given time), the Regulatory Impact Analysis contains discussions and cost estimates for certain specific provisions where the impact could be estimated for non-Class I and Class III railroads.

The only significant costs to Class III railroads imposed by this final rule are related to the training of employees. In the NPRM, FRA estimated that Class III railroads would absorb approximately 15 percent of the training costs being imposed on non-Class I railroads. This estimate was based on the fact that Class III railroads employ approximately 15 percent of the employees on non-Class I railroads and because virtually all of

the training costs are related to the number and types of employees employed by a railroad. FRA received no specific comment from any interested party objecting to this estimate. The final rule has been modified to reduce the potential impact of the training requirements on these small railroads based on comments received, by eliminating the need to develop internal audit programs and by allowing efficiency tests to be utilized to assess the effectiveness of a railroad's training program. Moreover, as discussed above and below, the training that employees of Class III railroads will be required to receive is significantly less than the required training of many employees on Class I and Class II railroads. Thus, although FRA believes that the actual cost to Class III railroads will be much less than the 15 percent originally assigned, FRA will retain the very conservative cost estimate related to training for Class III railroads of 15 percent of the training costs for non-Class I railroads which results in an estimated impact of approximately \$740,579, or less than \$1,200 for the average Class III railroad. These cost will be apportioned among the 600 to 650 Class III railroads, and will vary according to the number of employees each railroad must train. This is a rough estimate based on the number of Class III employees as a percentage of total employees. Actual impact should be less, as discussed below.

#### 4. A Description of the Projected Reporting, Recordkeeping and Other Compliance Requirements of the Final Rule, Including an Estimate of the Classes of Small Entities Which Will Be Subject to the Requirements and the Type of Professional Skills Necessary for Preparation of the Report or Record

Other than the training requirements discussed above, this rule will have a *de minimus* impact on small entities. Most of the final rule provisions will not effect small railroad costs because of the nature and limits to their operations, or the small railroad costs are inseparable from the industry-wide costs. For example, small railroads do not generally operate helper locomotives, so they will not be subject to the costs associated with that new rule provision. In the case of provisions such as those requiring piston travel stickers, FRA has no basis for assigning to any particular segment of the industry the costs for equipping the entire fleet of non-standard piston travel cars with piston travel stickers. But in reality, it is unlikely that these costs will fall on the smaller railroads.

In various places in the Regulatory Impact Analysis, FRA has attempted to assign burdens to the smaller members of the industry based on some measure of their size relative to the rest of the industry. In those cases, FRA has probably overestimated the burden for the smaller carriers. A good example is the requirement regarding the repair and documentation of dynamic brake failures. While FRA has assigned these costs based on the total number of locomotives operated by each segment of the industry, the reality is that few small railroads operate locomotives equipped with operative dynamic brakes and they will not actually be subject to these costs. The costs shown in the Regulatory Impact Analysis should be viewed as a maximum. Similarly, smaller railroads perform a limited number of Class I brake tests, do not generally own and operate yard air sources, and do not usually perform the type of maintenance that will trigger the new record keeping requirements, thus the reporting and record keeping requirements related to those activities will be minimal or non-existent for these smaller carriers.

#### 5. Federal Rules Which May Duplicate, Overlap, or Conflict With the Rule

None.

##### *Significant Alternatives:*

1. Differing compliance or reporting requirements or timetables which take into account the resources available to small entities:
2. Clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities:
3. Exemption from coverage of the rule, or any part thereof, for such small entities:

FRA considered the role that non-Class I railroads (Class II and III railroads) have in today's freight industry. FRA believes that the current marketplace requires Class I railroads and these smaller railroads to operate as an integrated system. Many of today's smaller railroads rely on Class I railroads for the training of their employees and the maintenance of their equipment. In addition, many non-Class I railroads and Class I railroads interchange and operate each other's equipment. Therefore, except in limited circumstances, it is impossible, from a regulatory standpoint, to separate these smaller railroads from the larger Class I railroads. Therefore, in order to ensure the safety and quality of train and locomotive power braking systems throughout the entire freight industry, this final rule generally imposes a consistent set of requirements on Class

I, II, and III railroads as a group. Although FRA recognizes that many of the operational benefits created by this final rule are not available to many of the smaller operations, FRA feels that the integrated nature of the freight industry requires that universally consistent requirements be imposed on both Class I and non-Class I railroads.

Where possible, efforts were taken in this final rule to minimize the impact on non-Class I railroads. The dynamic brake provisions of this final rule provide railroads with the option of declaring the dynamic brake portion of a locomotive deactivated. Thus, smaller railroads which do not choose to utilize dynamic brakes are not required to incur the cost of maintaining the equipment. The final rule also eliminates the proposed requirement to stencil a locomotive with deactivated dynamic brakes which further reduces the cost to smaller railroads. The final rule permits railroads to perform Class II brake tests on cars added to a train received in interchange, if the train will travel a distance not to exceed 20 miles from the point at which it was received in interchange. The current regulations require the performance of at least a transfer train brake test on the entire train, rather than testing only those cars added. FRA believes this will provide a cost savings to smaller railroads as they generally move short distances from interchange points to destination.

Furthermore, virtually all of the inspection and testing requirements imposed by this final rule on Class III railroads reflect current practices on those operations.

The final rule also modifies some of the proposed training requirements in order to reduce the costs to smaller railroads based on comments received by the ASLRRRA. The final rule eliminates the requirement that railroads develop an internal audit program to assess the effectiveness of their training programs and allows efficiency tests to be utilized to assess the effectiveness of such programs. This was a change requested by the ASLRRRA and will reduce the impact of the training requirements by permitting smaller railroads to utilize existing supervisory oversight to assess the effectiveness of training. The final rule also clarifies that each employee need only be trained on the knowledge and skills necessary to perform the tasks they are required to perform. Because employees of Class III railroads generally are not required to perform many of the tasks covered by this final rule, these employees would not be required to be trained on those tasks. For example, Class III railroads generally do not operate a large variety of brake systems on their lines thus, their employees would only have to be trained on a limited number of different brake systems. In addition, the

employees of Class III railroads generally will not be required to receive any training in the areas of EPIC brakes, dynamic brakes, two-way EOT devices, or on some of the brake tests and maintenance mandated in this final rule due to the limited distances traveled by trains on these operations, the low tonnages hauled, and because many of the maintenance functions on these smaller railroads are contracted out to larger railroads. Thus, the final rule has attempted to narrow the training requirements for employees of smaller railroads to only those tasks they are required to perform and thus, reduce the economic impact of the requirements.

4. Use of performance, rather than design standards:

Where possible, especially with regard to advanced technologies and certain brake system components, an attempt was made to tie the proposed requirements to performance.

C. Paperwork Reduction Act

The information collection requirements in this final rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* The sections that contain the new information collection requirements and the estimated time to fulfill each requirement are as follows:

CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost (dollars)
229.27—Annual tests .....	20,000 locomotives .....	18,000 tests .....	15 minutes .....	4,500 hours .....	157,500
231.31—Drawbars for freight cars—approval to operate on track with non-standard gage.	545 railroads .....	0 letters .....	N/A .....	N/A .....	N/A
232.1—Purpose and Scope—Requests for Earlier Application to comply with Subparts D through F.	545 railroads .....	4 requests/letters .....	60 minutes .....	4 hours .....	180
232.3—Applicability— Export, industrial, & other cars not owned by railroads-identification.	545 railroads .....	8 cards .....	10 minutes .....	1 hour .....	45
232.7—Waivers .....	545 railroads .....	10 petitions .....	40 hours .....	400 hours .....	18,000
232.11—Penalties— Knowing falsifying a record/report.	545 railroads .....	1 falsified recd/rpt .....	10 minutes .....	.20 hour .....	9
232.15—Movement of Defective Equipment:					
—Tags .....	1,620,000 cars .....	128,400 tags .....	2.5 minutes .....	5,350 hours .....	187,250
— Written Notification	1,620,000 cars .....	21,200 notices .....	3 minutes .....	1,060 hours .....	37,100
232.17—Special Approval Procedure:					
—Petitions for special approval of safety-critical revision.	545 railroads .....	4 petition .....	100 hours .....	400 hours .....	18,000
—Petitions for special approval of pre-revenue service acceptance plan.	545 railroads .....	2 petitions .....	100 hours .....	200 hours .....	9,000
—Service of petitions	545 railroads .....	6 petitions .....	40 hours .....	240 hours .....	10,800
—Statement of interest.	Public/railroads .....	20 statements .....	8 hours .....	160 hours .....	7,200
—Comments .....	Public/railroads .....	15 comments .....	4 hours .....	60 hours .....	2,700

CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost (dollars)
232.103—Gen'l requirements—all train brake systems:	1,600,000 cars .....	246,866 stickers .....	10 minutes .....	41,144 hours .....	835,156
—Locomotives—1st Year—Procedures.	545 railroads .....	50 procedures .....	4 hours .....	200 hours .....	9,000
—Locomotives—Subsequent Years—Procedures.	25 new railroads .....	1 procedure .....	4 hours .....	4 hours .....	180
232.105—Gen'l requirements for locomotives-Inspection.	545 railroads .....	20,000 insp. forms .....	5 minutes .....	1,667 hours .....	58,345
232.107—Air source requirements:					
—1st Year .....	545 railroads .....	50 plans .....	40 hours .....	2,000 hours .....	90,000
—Subsequent Years	25 new railroads .....	1 plan .....	40 plans .....	40 hours .....	1,800
—Amendments to Plan.	50 existing plans .....	10 amendments .....	20 hours .....	200 hours .....	9,000
—Recordkeeping .....	50 existing plans .....	1,150 records .....	20 hours .....	23,000 hours .....	1,035,000
—Cold weather situations.	545 railroads .....	37 plans .....	20 hours .....	740 hours .....	33,300
232.109—Dynamic brake requirements:					
—status .....	545 railroads .....	1,656,000 records .....	4 minutes .....	110,400 hours .....	3,864,000
—Inoperative dynamic brakes.	20,000 locomotives .....	6,358 repair recds .....	4 minutes .....	424 hours .....	14,840
—Tag bearing words "inoperative dynamic brakes".	20,000 locomotives .....	6,358 tags .....	30 seconds .....	53 hours .....	1,855
—Deactivated dynamic brakes—1st Year.	8,000 locomotives .....	2,800 stencilings .....	5 minutes .....	233 hours .....	8,155
—Subsequent Years	8,000 locomotives .....	20 stencilings .....	5 minutes .....	2 hours .....	70
—Displays to Locomotive Engineer-Deceleration rate.	8,000 locomotives .....	2,800,000 Disp. .....	.50 second .....	400 hours .....	0
—Operating rules—1st Year.	545 railroads .....	300 oper. rules .....	4 hours .....	1,200 hours .....	54,000
—Subsequent Years	5 new railroads .....	5 operating rules .....	4 hours .....	20 hours .....	900
—Amendments .....	545 railroads .....	15 amendments .....	1 hour .....	15 hours .....	675
—Miles-per-hour-overspeed-top rule in operating proc..	545 railroads .....	545 rules .....	60 minutes .....	545 hours .....	24,525
—Requests to increase 5 mph overspeed restriction.	545 railroads .....	5 requests/ltrrs. .....	30 min. + 20 hrs. .....	103 hours .....	4,635
—Knowledge criteria—locomotive engineers—1st Year.	545 railroads .....	300 amendments .....	16 hours .....	4,800 hours .....	216,000
—Subsequent Years	5 new railroads .....	5 amendments .....	16 hours .....	80 hours .....	3,600
232.111—Train information handling:					
—1st Year .....	545 railroads .....	545 procedures .....	50 hours .....	27,250 hours .....	1,226,250
—Subsequent Years	10 new railroads .....	10 procedures .....	40 hours .....	400 hours .....	18,000
—Amendments .....	100 railroads .....	100 amendments .....	20 hours .....	2,000 hours .....	90,000
—Report requirements to train crew.	545 railroads .....	2,112,000 reports .....	10 minutes .....	352,000 hours .....	12,320,000
232.203—Training requirements—Tr. Prog.:					
—1st Year .....	545 railroads .....	300 programs .....	100 hours .....	30,000 hours .....	1,350,000
—Subsequent years	15 railroads .....	1 program .....	100 hours .....	100 hours .....	4,500
—Amendments to written program.	545 railroads .....	545 amendments .....	8 hours .....	4,360 hours .....	196,200
—Training records .....	545 railroads .....	67,000 records .....	8 minutes .....	8,933 hours .....	312,655
—Training notifications.	545 railroads .....	67,000 notific. .....	3 minutes .....	3,350 hours .....	117,250
—Audit program .....	545 railroads .....	545 plans .....	40 hours .....	21,800 hours .....	981,000
—Amendment to audit program.	545 railroads .....	50 amendments .....	20 hours .....	1,000 hours .....	45,000
232.205—Class 1 brake test—Notifications.	545 railroads .....	1,656,000 notific. .....	45 seconds .....	20,700 hours .....	724,500
232.207—Class 1A brake tests:					
—1st Year .....	545 railroads .....	25 lists .....	30 minutes .....	13 hours .....	585
—subsequent years	545 railroads .....	1 list .....	1 hour .....	1 hour .....	45
—Notification .....	545 railroads .....	5 amendments .....	1 hour .....	5 hours .....	225
232.209—Class II brake tests-intermediate inspection.	545 railroads .....	1,600,000 comnt .....	3 seconds .....	1,333 hours .....	46,655
—Operator of train ...	545 railroads .....	1,600,000 comm. .....	2 seconds .....	889 hours .....	31,115
—Electronic communication link.	545 railroads .....	32,000 messages .....	2 seconds .....	18 hours .....	630

CFR section	Respondent universe	Total annual responses	Average time per response	Total annual burden hours	Total annual burden cost (dollars)
232.211—Class II brake test-trainline continuity insp.	545 railroads .....	500,000 commun. ....	5 seconds .....	694 hours .....	24,290
—Electronic communication link.	545 railroads .....	5,000 messages .....	5 seconds .....	7 hours .....	245
232.213—Extended haul trains.	84,000 long dist. mvmts.	70 letters .....	15 minutes .....	18 hours .....	810
—Record of all defective/inoperative brakes.	84,000 long dist. mvmts.	25,200 records .....	20 minutes .....	8,400 hours .....	294,000
232.303—Gen'l requirements—single car test.	1,600,000 frgt. cars .....	5,600 tags .....	5 minutes .....	467 hours .....	16,345
—Last repair track brake test/single car test.	1,600,000 frgt. cars .....	320,000 stncl. ....	5 minutes .....	26,667 hours .....	993,345
232.307—Single Car .....	545 railroads .....	Inc. under 232.17 .....	Inc. under 232.17 .....	Inc. under 232.17 .....	Inc. under 232.17
232.309—Repair track brake test.	640 shops .....	5,000 tests .....	30 minutes .....	2,500 hours .....	87,500
232.403—Design stds—1 way end-of-train (EOTs) dev..	545 railroads .....	4 billion mess. ....	1/186,000 sec. ....	6 hours .....	0
—Unique Code .....	545 railroads .....	12 requests .....	5 minutes .....	1 hour .....	35
232.405—Design + Performance stds.—2 way EOTs.	545 railroads .....	8 billion mess. ....	1/186,000 sec. ....	12 hours .....	0
232.407—Operations 2-way EOTs.	545 railroads .....	50,000 comm. ....	30 seconds .....	417 hours .....	14,595
232.409—Insp. and Testing of EOTs.	245 railroads .....	450,000 comm. ....	30 seconds .....	3,750 hours .....	168,750
—Telemetry Equipment—Testing and Calibration.	245 railroads .....	32,708 units .....	1 minute .....	545 hours .....	24,525
232.503—Process to introduce new brake technology.	545 railroads .....	1 letter .....	1 hour .....	1 hour .....	45
—Special approval ...	545 railroads .....	1 request .....	3 hours .....	3 hours .....	135
232.505—Pre-revenue service accept. test plan:					
—1st Yr. ....	545 railroads .....	1 main. procedure .....	160 hours .....	160 hours .....	7,200
—Subsequent years	545 railroads .....	1 main. procedure .....	160 hours .....	160 hours .....	7,200
—Amendments .....	545 railroads .....	1 main. procedure .....	40 hours .....	40 hours .....	1,800
—Design description	545 railroads .....	1 petition .....	67 hours .....	67 hours .....	3,015
—Report to FRA Assoc. Admin.. for Safety.	545 railroads .....	1 report .....	13 hours .....	13 Hours .....	585
—Brake system technology testing.	545 railroads .....	5 descriptions .....	40 hours .....	200 hours .....	9,000

All estimates include the time for reviewing instructions; searching existing data sources; gathering or maintaining the needed data; and reviewing the information. For information or a copy of the paperwork package submitted to OMB contact Robert Brogan at 202-493-6292.

OMB is required to make a decision concerning the collection of information requirements contained in this final rule between 30 and 60 days after publication of this document in the **Federal Register**.

FRA cannot impose a penalty on persons for violating information collection requirements which do not display a current OMB control number, if required. This final rule has been assigned OMB control number 2130-0008.

*D. Environmental Impact*

FRA has evaluated this final rule in accordance with its "Procedures for

Considering Environmental Impacts" (FRA Procedures)(64 FR 28545, May 26, 1999) as required by the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), other environmental statutes, Executive Orders, and related regulatory requirements. FRA has determined that this final rule is not a major FRA action (requiring the preparation of an environmental impact statement or environmental assessment) because it is categorically excluded from detailed environmental review pursuant to section 4(c) of FRA's Procedures. Section 4(c) of FRA's Procedures identifies twenty classes of FRA actions that are categorically excluded from the requirements for conducting a detailed environmental review. FRA further considered this final rule in accordance with section 4(c) and (e) of FRA's Procedures to determine if extraordinary circumstances exist with respect to this final rule that might trigger the need for a more detailed environmental review.

After conducting this review, FRA has determined that extraordinary circumstances do not exist because this final rule: Is not judged to be environmentally controversial; is not inconsistent with Federal, State, or local laws, regulations, ordinances, or judicial or administrative determinations relating to environmental protection; will not have any significant adverse impact on any natural, cultural, recreational, or scenic environments; will not use protected properties, involve new construction in wetlands, or affect a base floodplain; and will not cause a significant short- or long-term increase in traffic congestion or other adverse environmental impact on any mode of transportation. As a result, FRA finds that this regulation is not a major Federal action significantly effecting the quality of the human environment.

E. Federalism Implications

FRA believes it is in compliance with Executive Order 13132. This final rule will not have a substantial effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. This final rule will not have federalism implications that impose substantial direct compliance costs on State and local governments. FRA notes that States involved in the State Participation Program, pursuant to 49 CFR part 212, may incur minimal costs associated with the training of their inspectors involved in the enforcement of this final rule. Meanwhile, State officials were consulted to a practicable extent through their participation in the RSAC, a federal advisory committee discussed earlier in the preamble. Although this rule was removed from the RSAC process prior to the issuance of the 1998 NPRM, representatives of state officials were represented in the RSAC Power Brake Working Group and the concerns and comments raised by these representatives during that process were fully considered during the development of both the 1998 NPRM and this final rule. Specifically, the National Association of Regulatory Commissioners, the American Association of State Highway and Transportation Officials, and the California Public Utilities Commission (CAPUC) were all represented when this rule was being considered by the RSAC Power Brake Working Group. The CAPUC submitted extensive comments in response to the 1998 NPRM which are detailed and addressed in the preamble to this final rule.

In any event, Federal preemption of a State or local law occurs automatically as a result of the statutory provision contained at 49 U.S.C. 20106 when FRA issues a regulation covering the same subject matter as a State or local law unless the State or local law is designed to reduce an essentially local safety hazard, is not incompatible with Federal law, and does not place an unreasonable burden on interstate commerce (see discussion in the section-by-section analysis of § 232.13). It should be noted that the potential for preemption also exists under various other statutory and constitutional provisions. These include: the Locomotive Inspection Act (now codified at 49 U.S.C. 20701–20703), the Safety Appliance Acts (now codified at 49 U.S.C. 20301–20304), and the Commerce Clause of the United States Constitution.

List of Subjects

49 CFR Part 229

Railroad locomotive safety, Railroad safety.

49 CFR Part 231

Railroad safety, Railroad safety appliances.

49 CFR Part 232

Incorporation by reference, Railroad power brakes, Railroad safety, Two-way end-of-train devices.

The Rule

In consideration of the following, FRA amends chapter II, subtitle B of title 49, Code of Federal Regulations as follows:

Part 229—[AMENDED]

1. The authority citation for part 229 is revised to read as follows:

Authority: 49 U.S.C. 20102–20103, 20107, 20133, 20137–20138, 20143, 20701–20703, 21301–21302, 21304; 49 CFR 1.49(c), (m).

2. Section 229.5 is amended by adding a new paragraph (p) to read as follows:

§ 229.5 Definitions.

\* \* \* \* \*

(p) Electronic air brake means a brake system controlled by a computer which provides the means for control of the locomotive brakes or train brakes or both.

3. Section 229.25 is amended by revising paragraph (a) to read as follows:

§ 229.25 Tests: Every periodic inspection.

\* \* \* \* \*

(a) All mechanical gauges used by the engineer to aid in the control or braking of the train or locomotive, except load meters used in conjunction with an auxiliary brake system, shall be tested by comparison with a dead-weight tester or a test gauge designed for this purpose.

\* \* \* \* \*

4. Section 229.27 is amended by revising paragraph (b) to read as follows:

§ 229.27 Annual tests.

\* \* \* \* \*

(b) The load meter shall be tested. Each device used by the engineer to aid in the control or braking of the train or locomotive that provides an indication of air pressure electronically shall be tested by comparison with a test gauge or self-test designed for this purpose. An error of greater than five percent or three pounds per square inch shall be corrected. The date and place of the test shall be recorded on Form FRA F 6180–49A, and the person conducting the test

and that person’s supervisor shall sign the form.

\* \* \* \* \*

5. Section 229.53 is revised to read as follows:

§ 229.53 Brake gauges.

All mechanical gauges and all devices providing indication of air pressure electronically that are used by the engineer to aid in the control or braking of the train or locomotive shall be located so that they may be conveniently read from the engineer’s usual position during operation of the locomotive. A gauge or device shall not be more than five percent or three pounds per square inch in error, whichever is less.

Part 231—[AMENDED]

6. The authority citation for part 231 is revised to read as follows:

Authority: 49 U.S.C. 20102–20103, 20107, 20131, 20301–20303, 21301–21302, 21304; 49 CFR 1.49(c), (m).

7. Section 231.0 is amended by adding paragraphs (b)(3) through (5) and paragraph (g) to read as follows:

§ 231.0 Applicability and penalties.

\* \* \* \* \*

(b) \* \* \* (3) Freight and other non-passenger trains of four-wheel coal cars.

(4) Freight and other non-passenger trains of eight-wheel standard logging cars if the height of each car from the top of the rail to the center of the coupling is not more than 25 inches.

(5) A locomotive used in hauling a train referred to in paragraph (b)(4) of this section when the locomotive and cars of the train are used only to transport logs.

\* \* \* \* \*

(g) Except as provided in paragraph (b) of this section, § 231.31 also applies to an operation on a 24-inch, 36-inch, or other narrow gage railroad.

8. Part 231 is further amended by adding § 231.31 to read as follows:

§ 231.31 Drawbars for freight cars; standard height.

(a) Except on cars specified in paragraph (b) of this section—

(1) On standard gage (56½-inch gage) railroads, the maximum height of drawbars for freight cars (measured perpendicularly from the level of the tops of the rails to the centers of the drawbars) shall be 34½ inches, and the minimum height of drawbars for freight cars on such standard gage railroads (measured in the same manner) shall be 31½ inches.

(2) On 36-inch gage railroads, the maximum height of drawbars for freight cars (measured perpendicularly from the level of the tops of the rails to the centers of the drawbars) shall be 26 inches, and the minimum height of drawbars for freight cars on such 36-inch gage railroads (measured in the same manner) shall be 23 inches.

(3) On 24-inch gage railroads, the maximum height of drawbars for freight cars (measured perpendicularly from the level of the tops of the rails to the centers of the drawbars) shall be 17½ inches, and the minimum height of drawbars for freight cars on 24-inch gage railroads (measured in the same manner) shall be 14½ inches.

(4) On railroads operating on track with a gage other than those contained in paragraphs (a)(1) through (a)(3) of this section, the maximum and minimum height of drawbars for freight cars operating on those railroads shall be established upon written approval of FRA.

(b) This section shall not apply to a railroad all of whose track is less than 24 inches in gage.

9. Appendix A of Part 231 is amended by adding an entry for § 231.31 to the end of the Schedule of Civil Penalties to read as follows:

**Appendix A to Part 231—Schedule of Civil Penalties**

FRA safety appliance defect code section	Violation	Willful violation
* * *	*	*
231.31 Drawbars, standard height .....	2,500	5,000
* * *	*	*

10. Part 232 is revised to read as follows:

**PART 232—BRAKE SYSTEM SAFETY STANDARDS for FREIGHT and OTHER NON-PASSENGER TRAINS and EQUIPMENT; END-of-TRAIN DEVICES**

**Subpart A—General**

- Sec.
- 232.1 Scope.
- 232.3 Applicability.
- 232.5 Definitions.
- 232.7 Waivers.
- 232.9 Responsibility for compliance.
- 232.11 Penalties.
- 232.13 Preemptive effect.
- 232.15 Movement of defective equipment.
- 232.17 Special approval procedure.
- 232.19 Availability of records.
- 232.21 Information collection.

**Subpart B—General Requirements**

- 232.101 Scope.

- 232.103 General requirements for all train brake systems.
- 232.105 General requirements for locomotives.
- 232.107 Air source requirements and cold weather operations.
- 232.109 Dynamic brake requirements.
- 232.111 Train handling information.

**Subpart C—Inspection and Testing Requirements**

- 232.201 Scope.
- 232.203 Training requirements.
- 232.205 Class I brake tests—initial terminal inspection.
- 232.207 Class IA brake tests—1,000-mile inspection.
- 232.209 Class II brake tests—intermediate inspection.
- 232.211 Class III brake tests—trainline continuity inspection.
- 232.213 Extended haul trains.
- 232.215 Transfer train brake tests.
- 232.217 Train brake tests conducted using yard air.
- 232.219 Double heading and helper service.

**Subpart D—Periodic Maintenance and Testing Requirements**

- 232.301 Scope.
- 232.303 General requirements.
- 232.305 Repair track air brake tests.
- 232.307 Single car tests.
- 232.309 Repair track air brake test and single car test equipment and devices.

**Subpart E—End-of-Train Devices**

- 232.401 Scope.
- 232.403 Design standards for one-way end-of-train devices.
- 232.405 Design and performance standards for two-way end-of-train devices.
- 232.407 Operations requiring use of two-way end-of-train devices; prohibition on purchase of nonconforming devices.
- 232.409 Inspection and testing of end-of-train devices.

**Subpart F—Introduction of New Brake System Technology**

- 232.501 Scope.
- 232.503 Process to introduce new brake system technology.
- 232.505 Pre-revenue service acceptance testing plan.

**Appendix A—Schedule of Civil Penalties**

**Appendix B—49 CFR part 232 prior to April 1, 2001**

**Authority:** 49 U.S.C. 20102–20103, 20107, 20133, 20141, 20301–20303, 20306, 21301–21302, 21304; 49 CFR 1.49(c), (m).

**Subpart A—General**

**§ 232.1 Scope.**

(a) This part prescribes Federal safety standards for freight and other non-passenger train brake systems and equipment. Subpart E of this part prescribes Federal safety standards not only for freight and other non-passenger train brake systems and equipment, but also for passenger train brake systems. This part does not restrict a railroad

from adopting or enforcing additional or more stringent requirements not inconsistent with this part.

(b) Except as otherwise specifically provided in this paragraph or in this part, railroads to which this part applies shall comply with all the requirements contained in subparts A through C and subpart F of this part beginning on April 1, 2004. Sections 232.1 through 232.13 and 232.17 through 232.21 of this part will become applicable to all railroads to which this part applies beginning on April 1, 2001. Subpart D of this part will become applicable to all railroads to which this part applies beginning on August 1, 2001. Subpart E of this part will become applicable to all trains operating on track which is part of the general railroad system of transportation beginning on April 1, 2001.

(c) A railroad may request earlier application of the requirements contained in subparts A through C and subpart F of this part upon written notification to FRA’s Associate Administrator for Safety. Such a request shall indicate the railroad’s readiness and ability to comply with all of the requirements contained in those subparts.

(d) Except for operations identified in § 232.3(c)(1), (c)(4), and (c)(6) through (c)(8), all railroads which are part of the general railroad system of transportation shall operate pursuant to the requirements contained in this part 232 as it existed on April 1, 2001 and included as Appendix B to this part until they are either required to operate pursuant to the requirements contained in this part or the requirements contained in part 238 of this chapter or they elect to comply earlier than otherwise required with the requirements contained in this part or the requirements contained in part 238 of this chapter.

**§ 232.3 Applicability.**

(a) Except as provided in paragraphs (b) and (c) of this section, this part applies to all railroads that operate freight or other non-passenger train service on standard gage track which is part of the general railroad system of transportation. This includes the operation of circus trains and private cars when hauled on such railroads.

(b) Subpart E of this part, “End-of-Train Devices,” applies to all trains operating on track which is part of the general railroad system of transportation unless specifically excepted in that subpart.

(c) Except as provided in § 232.1(d) and paragraph (b) of this section, this part does not apply to:

(1) A railroad that operates only on track inside an installation that is not part of the general railroad system of transportation.

(2) Intercity or commuter passenger train operations on standard gage track which is part of the general railroad system of transportation;

(3) Commuter or other short-haul rail passenger train operations in a metropolitan or suburban area (as described by 49 U.S.C. 20102(1)), including public authorities operating passenger train service;

(4) Rapid transit operations in an urban area that are not connected with the general railroad system of transportation;

(5) Tourist, scenic, historic, or excursion operations, whether on or off the general railroad system;

(6) Freight and other non-passenger trains of four-wheel coal cars;

(7) Freight and other non-passenger trains of eight-wheel standard logging cars if the height of each car from the top of the rail to the center of the coupling is not more than 25 inches; or

(8) A locomotive used in hauling a train referred to in paragraph (c)(7) of this subsection when the locomotive and cars of the train are used only to transport logs.

(d) The provisions formerly contained in Interstate Commerce Commission Order 13528, of May 30, 1945, as amended, now revoked, are codified in this paragraph. This part is not applicable to the following equipment:

(1) Scale test weight cars.

(2) Locomotive cranes, steam shovels, pile drivers, and machines of similar construction, and maintenance machines built prior to September 21, 1945.

(3) Export, industrial, and other cars not owned by a railroad which are not to be used in service, except for movement as shipments on their own wheels to given destinations. Such cars shall be properly identified by a card attached to each side of the car, signed by the shipper, stating that such movement is being made under the authority of this paragraph.

(4) Industrial and other than railroad-owned cars which are not to be used in service except for movement within the limits of a single switching district (i.e., within the limits of an industrial facility).

(5) Narrow-gage cars.

(6) Cars used exclusively in switching operations and not used in train movements within the meaning of the Federal safety appliance laws (49 U.S.C. 20301–20306).

*AAR* means the Association of American Railroads.

*Air brake* means a combination of devices operated by compressed air, arranged in a system, and controlled manually, electrically, electronically, or pneumatically, by means of which the motion of a railroad car or locomotive is retarded or arrested.

*Air Flow Indicator, AFM* means a specific air flow indicator required by the air flow method of qualifying train air brakes (AFM). The AFM Air Flow Indicator is a calibrated air flow measuring device which is clearly visible and legible in daylight and darkness from the engineer's normal operating position. The indicator face displays:

(1) Markings from 10 cubic feet per minute (CFM) to 80 CFM, in increments of 10 CFM or less; and

(2) Numerals indicating 20, 40, 60, and 80 CFM for continuous monitoring of air flow.

*Bind* means restrict the intended movement of one or more brake system components by reduced clearance, by obstruction, or by increased friction.

*Brake, dynamic* means a train braking system whereby the kinetic energy of a moving train is used to generate electric current at the locomotive traction motors, which is then dissipated through resistor grids or into the catenary or third rail system.

*Brake, effective* means a brake that is capable of producing its required designed retarding force on the train. A car's air brake is not considered effective if it is not capable of producing its designed retarding force or if its piston travel exceeds:

(1) 10½ inches for cars equipped with nominal 12-inch stroke brake cylinders; or

(2) the piston travel limits indicated on the stencil, sticker, or badge plate for that brake cylinder.

*Brake, hand* means a brake that can be applied and released by hand to prevent or retard the movement of a locomotive.

*Brake indicator* means a device which indicates the brake application range and indicates whether brakes are applied and released.

*Brake, inoperative* means a primary brake that, for any reason, no longer applies or releases as intended.

*Brake, inoperative dynamic* means a dynamic brake that, for any reason, no longer provides its designed retarding force on the train.

*Brake, parking* means a brake that can be applied by means other than by hand, such as spring, hydraulic, or air pressure when the brake pipe air is depleted, or by an electrical motor.

*Brake pipe* means the system of piping (including branch pipes, angle cocks, cutout cocks, dirt collectors, hoses, and hose couplings) used for connecting locomotives and all railroad cars for the passage of compressed air.

*Brake, primary* means those components of the train brake system necessary to stop the train within the signal spacing distance without thermal damage to friction braking surfaces.

*Brake, secondary* means those components of the train brake system which develop supplemental brake retarding force that is not needed to stop the train within signal spacing distances or to prevent thermal damage to wheels.

*Emergency application* means an irretrievable brake application resulting in the maximum retarding force available from the train brake system.

*End-of-train device, one-way* means two pieces of equipment linked by radio that meet the requirements of § 232.403.

*End-of-train device, two-way* means two pieces of equipment linked by radio that meet the requirements of §§ 232.403 and 232.405.

*Foul* means any condition which restricts the intended movement of one or more brake system components because the component is snagged, entangled, or twisted.

*Freight car* means a vehicle designed to carry freight, or railroad personnel, by rail and a vehicle designed for use in a work or wreck train or other non-passenger train.

*Initial terminal* means the location where a train is originally assembled.

*Locomotive* means a piece of railroad on-track equipment, other than hi-rail, specialized maintenance, or other similar equipment, which may consist of one or more units operated from a single control stand—

(1) With one or more propelling motors designed for moving other railroad equipment;

(2) With one or more propelling motors designed to transport freight or passenger traffic or both; or

(3) Without propelling motors but with one or more control stands.

*Locomotive cab* means that portion of the superstructure designed to be occupied by the crew operating the locomotive.

*Locomotive, controlling* means the locomotive from which the engineer exercises control over the train.

*Off air* means not connected to a continuous source of compressed air of at least 60 pounds per square inch (psi).

*Ordered date or date ordered* means the date on which notice to proceed is given by a procuring railroad to a contractor or supplier for new equipment.

### § 232.5 Definitions.

For purposes of this part—

*Piston travel* means the amount of linear movement of the air brake hollow rod (or equivalent) or piston rod when forced outward by movement of the piston in the brake cylinder or actuator and limited by the brake shoes being forced against the wheel or disc.

*Pre-revenue service acceptance testing plan* means a document, as further specified in § 232.505, prepared by a railroad that explains in detail how pre-revenue service tests of certain equipment demonstrate that the equipment meets Federal safety standards and the railroad's own safety design requirements.

*Previously tested equipment* means equipment that has received a Class I brake test pursuant to § 232.205 and has not been off air for more than four hours.

*Primary responsibility* means the task that a person performs at least 50 percent of the time. The totality of the circumstances will be considered on a case-by-case basis in circumstances where an individual does not spend 50 percent of the day engaged in any one readily identifiable type of activity.

*Qualified mechanical inspector* means a qualified person who has received, as a part of the training, qualification, and designation program required under § 232.203, instruction and training that includes "hands-on" experience (under appropriate supervision or apprenticeship) in one or more of the following functions: troubleshooting, inspection, testing, maintenance or repair of the specific train brake components and systems for which the person is assigned responsibility. This person shall also possess a current understanding of what is required to properly repair and maintain the safety-critical brake components for which the person is assigned responsibility. Further, the qualified mechanical inspector shall be a person whose primary responsibility includes work generally consistent with the functions listed in this definition.

*Qualified person* means a person who has received, as a part of the training, qualification, and designation program required under § 232.203, instruction and training necessary to perform one or more functions required under this part. The railroad is responsible for determining that the person has the knowledge and skills necessary to perform the required function for which the person is assigned responsibility. The railroad determines the qualifications and competencies for employees designated to perform various functions in the manner set forth in this part. Although the rule uses the term "qualified person" to describe

a person responsible for performing various functions required under this part, a person may be deemed qualified to perform some functions but not qualified to perform other functions. For example, although a person may be deemed qualified to perform the Class II/intermediate brake test required by this part, that same person may or may not be deemed qualified to perform the Class I/initial Terminal brake test or authorize the movement of defective equipment under this part. The railroad will determine the required functions for which an individual will be deemed a "qualified person" based upon the instruction and training the individual has received pursuant to § 232.203 concerning a particular function.

*Railroad* means any form of non-highway ground transportation that runs on rails or electromagnetic guideways, including:

(1) Commuter or short-haul railroad passenger service in a metropolitan or suburban area and commuter railroad service that was operated by the Consolidated Rail Corporation on January 1, 1979; and

(2) High speed ground transportation systems that connect metropolitan areas, without regard to whether those systems use new technologies not associated with traditional railroads. The term "railroad" is also intended to mean a person that provides transportation by railroad, whether directly or by contracting out operation of the railroad to another person. The term does not include rapid transit operations in an urban area that are not connected to the general railroad system of transportation.

*Rebuilt equipment* means equipment that has undergone overhaul identified by the railroad as a capital expense under the Surface Transportation Board's accounting standards.

*Refresher training* means periodic retraining required for employees or contractors to remain qualified to perform specific equipment troubleshooting, inspection, testing, maintenance, or repair functions.

*Respond as intended* means to produce the result that a device or system is designed to produce.

*"Roll-by" inspection* means an inspection performed while equipment is moving.

*Service application* means a brake application that results from one or more service reductions or the equivalent.

*Service reduction* means a decrease in brake pipe pressure, usually from 5 to 25 psi at a rate sufficiently rapid to move the operating valve to service position, but at a rate not rapid enough

to move the operating valve to emergency position.

*Solid block of cars* means two or more freight cars consecutively coupled together and added to or removed from a train as a single unit.

*State inspector* means an inspector of a participating State rail safety program under part 212 of this chapter.

*Switching service* means the classification of freight cars according to commodity or destination; assembling of cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement.

*Tourist, scenic, historic, or excursion operations* are railroad operations that carry passengers, often using antiquated equipment, with the conveyance of the passengers to a particular destination not being the principal purpose.

*Train* means one or more locomotives coupled with one or more freight cars, except during switching service.

*Train line* means the brake pipe or any non-pneumatic system used to transmit the signal that controls the locomotive and freight car brakes.

*Train, unit or train, cycle* means a train that, except for the changing of locomotive power and the removal or replacement of defective equipment, remains coupled as a consist and continuously operates from location A to location B and back to location A.

*Transfer train* means a train that travels between a point of origin and a point of final destination not exceeding 20 miles. Such trains may pick up or deliver freight equipment while en route to destination.

*Yard air* means a source of compressed air other than from a locomotive.

#### § 232.7 Waivers.

(a) Any person subject to a requirement of this part may petition the Administrator for a waiver of compliance with such requirement. The filing of such a petition does not affect that person's responsibility for compliance with that requirement while the petition is being considered.

(b) Each petition for waiver must be filed in the manner and contain the information required by part 211 of this chapter.

(c) If the Administrator finds that a waiver of compliance is in the public interest and is consistent with railroad safety, the Administrator may grant the waiver subject to any conditions the Administrator deems necessary. If a waiver is granted, the Administrator

publishes a notice in the **Federal Register** containing the reasons for granting the waiver.

**§ 232.9 Responsibility for compliance.**

(a) A railroad subject to this part shall not use, haul, permit to be used or hauled on its line, offer in interchange, or accept in interchange any train, railroad car, or locomotive with one or more conditions not in compliance with this part; however, a railroad shall not be liable for a civil penalty for such action if such action is in accordance with § 232.15. For purposes of this part, a train, railroad car, or locomotive will be considered in use prior to departure but after it has received, or should have received, the inspection required for movement and is deemed ready for service.

(b) Although many of the requirements of this part are stated in terms of the duties of a railroad, when any person performs any function required by this part, that person (whether or not a railroad) is required to perform that function in accordance with this part.

(c) Any person performing any function or task required by this part shall be deemed to have consented to FRA inspection of the person's operation to the extent necessary to determine whether the function or task is being performed in accordance with the requirements of this part.

**§ 232.11 Penalties.**

(a) Any person (including but not limited to a railroad; any manager, supervisor, official, or other employee or agent of a railroad; any owner, manufacturer, lessor, or lessee of railroad equipment, track, or facilities; any employee of such owner, manufacturer, lessor, lessee, or independent contractor) who violates any requirement of this part or causes the violation of any such requirement is subject to a civil penalty of at least \$500, but not more than \$11,000 per violation, except that: Penalties may be assessed against individuals only for willful violations, and, where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury to persons, or has caused death or injury, a penalty not to exceed \$22,000 per violation may be assessed. Each day a violation continues shall constitute a separate offense. Appendix A to this part contains a schedule of civil penalty amounts used in connection with this rule.

(b) Any person who knowingly and willfully falsifies a record or report required by this part is subject to

criminal penalties under 49 U.S.C. 21311.

**§ 232.13 Preemptive effect.**

(a) Under 49 U.S.C. 20106, issuance of the regulations in this part preempts any State law, rule, regulation, order, or standard covering the same subject matter, except for a provision necessary to eliminate or reduce a local safety hazard if that provision is not incompatible with this part and does not impose an undue burden on interstate commerce.

(b) Preemption should also be considered pursuant to the Locomotive Boiler Inspection Act (now codified at 49 U.S.C. 20701–20703), the Safety Appliance Acts (now codified at 49 U.S.C. 20301–20304), and the Commerce Clause based on the relevant case law pertaining to preemption under those provisions.

(c) FRA does not intend by issuance of the regulations in this part to preempt provisions of State criminal law that impose sanctions for reckless conduct that leads to actual loss of life, injury, or damage to property, whether such provisions apply specifically to railroad employees or generally to the public at large.

**§ 232.15 Movement of defective equipment.**

(a) *General provision.* Except as provided in paragraph (c) of this section, a railroad car or locomotive with one or more conditions not in compliance with this part may be used or hauled without civil penalty liability under this part only if *all* of the following conditions are met:

(1) The defective car or locomotive is properly equipped in accordance with the applicable provisions of 49 U.S.C. chapter 203 and the requirements of this part.

(2) The car or locomotive becomes defective while it is being used by the railroad on its line or becomes defective on the line of a connecting railroad and is properly accepted in interchange for repairs in accordance with paragraph (a)(7) of this section.

(3) The railroad first discovers the defective condition of the car or locomotive prior to moving it for repairs.

(4) The movement of the defective car or locomotive for repairs is from the location where the car or locomotive is first discovered defective by the railroad.

(5) The defective car or locomotive cannot be repaired at the location where the railroad first discovers it to be defective.

(6) The movement of the car or locomotive is necessary to make repairs to the defective condition.

(7) The location to which the car or locomotive is being taken for repair is the nearest available location where necessary repairs can be performed on the line of the railroad where the car or locomotive was first found to be defective or is the nearest available location where necessary repairs can be performed on the line of a connecting railroad if:

(i) The connecting railroad elects to accept the defective car or locomotive for such repair; and

(ii) The nearest available location where necessary repairs can be performed on the line of the connecting railroad is no farther than the nearest available location where necessary repairs can be performed on the line of the railroad where the car or locomotive was found defective.

(8) The movement of the defective car or locomotive for repairs is not by a train required to receive a Class I brake test at that location pursuant to § 232.205.

(9) The movement of the defective car or locomotive for repairs is not in a train in which less than 85 percent of the cars have operative and effective brakes.

(10) The defective car or locomotive is tagged, or information is recorded, as prescribed in paragraph (b) of this section.

(11) Except for cars or locomotives with brakes cut out en route, the following additional requirements are met:

(i) A qualified person shall determine—

(A) That it is safe to move the car or locomotive; and

(B) The maximum safe speed and other restrictions necessary for safely conducting the movement.

(ii) The person in charge of the train in which the car or locomotive is to be moved shall be notified in writing and inform all other crew members of the presence of the defective car or locomotive and the maximum speed and other restrictions determined under paragraph (a)(11)(i)(B) of this section. A copy of the tag or card described in paragraph (b) of this section may be used to provide the notification required by this paragraph.

(iii) The defective car or locomotive is moved in compliance with the maximum speed and other restrictions determined under paragraph (a)(11)(i)(B) of this section.

(12) The defective car or locomotive is not subject to a Special Notice for Repair under part 216 of this chapter, unless the movement of the defective

car is made in accordance with the restrictions contained in the Special Notice.

(b) *Tagging of defective equipment.*

(1) At the place where the railroad first discovers the defect, a tag or card shall be placed on both sides of the defective equipment or locomotive and in the cab of the locomotive, or an automated tracking system approved for use by FRA shall be provided with the following information about the defective equipment:

- (i) The reporting mark and car or locomotive number;
- (ii) The name of the inspecting railroad;
- (iii) The name and job title of the inspector;
- (iv) The inspection location and date;
- (v) The nature of each defect;
- (vi) A description of any movement restrictions;
- (vii) The destination of the equipment where it will be repaired; and
- (viii) The signature, or electronic identification, of the person reporting the defective condition.

(2) The tag or card required by paragraph (b)(1) of this section shall remain affixed to the defective equipment until the necessary repairs have been performed.

(3) An electronic or written record or a copy of each tag or card attached to or removed from a car or locomotive shall be retained for 90 days and, upon request, shall be made available within 15 calendar days for inspection by FRA or State inspectors.

(4) Each tag or card removed from a car or locomotive shall contain the date, location, reason for its removal, and the signature of the person who removed it from the piece of equipment.

(5) Any automated tracking system approved by FRA to meet the tagging requirements contained in paragraph (b)(1) of this section shall be capable of being reviewed and monitored by FRA at any time to ensure the integrity of the system. FRA's Associate Administrator for Safety may prohibit or revoke a railroad's authority to utilize an approved automated tracking system in lieu of tagging if FRA finds that the automated tracking system is not properly secure, is inaccessible to FRA or a railroad's employees, or fails to adequately track and monitor the movement of defective equipment. FRA will record such a determination in writing, include a statement of the basis for such action, and provide a copy of the document to the railroad.

(c) *Movement for unloading or purging of defective cars.* If a defective car is loaded with a hazardous material or contains residue of a hazardous

material, the car may not be placed for unloading or purging unless unloading or purging is consistent with determinations made and restrictions imposed under paragraph (a)(11)(i) of this section and the unloading or purging is necessary for the safe repair of the car.

(d) *Computation of percent operative power brakes.*

(1) The percentage of operative power brakes in a train shall be based on the number of control valves in the train. The percentage shall be determined by dividing the number of control valves that are cut-in by the total number of control valves in the train. A control valve shall not be considered cut-in if the brakes controlled by that valve are inoperative. Both cars and locomotives shall be considered when making this calculation.

(2) The following brake conditions not in compliance with this part are not considered inoperative power brakes for purposes of this section:

- (i) Failure or cutting out of secondary brake systems;
- (ii) Inoperative or otherwise defective handbrakes or parking brakes;
- (iii) Piston travel that is in excess of the Class I brake test limits required in § 232.205 but that does not exceed the outside limits contained on the stencil, sticker, or badge plate required by § 232.103(g) for considering the power brakes to be effective; and
- (iv) Power brakes overdue for inspection, testing, maintenance, or stenciling under this part.

(e) *Placement of equipment with inoperative brakes.*

(1) A freight car or locomotive with inoperative brakes shall not be placed as the rear car of the train.

(2) No more than two freight cars with either inoperative brakes or not equipped with power brakes shall be consecutively placed in the same train.

(3) Multi-unit articulated equipment shall not be placed in a train if the equipment has more than two consecutive individual control valves cut-out or if the brakes controlled by the valves are inoperative.

(f) *Guidelines for determining locations where necessary repairs can be performed.* The following guidelines will be considered by FRA when determining whether a location is a location where repairs to a car's brake system or components can be performed and whether a location is the nearest location where the needed repairs can be effectuated.

(1) The following general factors and guidelines will be considered when making determinations as to whether a

location is a location where brake repairs can be performed:

- (i) The accessibility of the location to persons responsible for making repairs;
- (ii) The presence of hazardous conditions that affect the ability to safely make repairs of the type needed at the location;
- (iii) The nature of the repair necessary to bring the car into compliance;
- (iv) The need for railroads to have in place an effective means to ensure the safe and timely repair of equipment;
- (v) The relevant weather conditions at the location that affect accessibility or create hazardous conditions;
- (vi) A location need not have the ability to effectuate every type of brake system repair in order to be considered a location where some brake repairs can be performed;
- (vii) A location need not be staffed continuously in order to be considered a location where brake repairs can be performed;
- (viii) The ability of a railroad to perform repair track brake tests or single car tests at a location shall not be considered; and
- (ix) The congestion of work at a location shall not be considered

(2) The general factors and guidelines outlined in paragraph (f)(1) of this section should be applied to the following locations:

- (i) A location where a mobile repair truck is used on a regular basis;
- (ii) A location where a mobile repair truck originates or is permanently stationed;
- (iii) A location at which a railroad performs mechanical repairs other than brake system repairs; and
- (iv) A location that has an operative repair track or repair shop;

(3) In determining whether a location is the nearest location where the necessary brake repairs can be made, the distance to the location is a key factor but should not be considered the determining factor. The distance to a location must be considered in conjunction with the factors and guidance outlined in paragraphs (f)(1) and (f)(2) of this section. In addition, the following safety factors must be considered in order to optimize safety:

- (i) The safety of the employees responsible for getting the equipment to or from a particular location; and
- (ii) The potential safety hazards involved with moving the equipment in the direction of travel necessary to get the equipment to a particular location.

(g) Based on the guidance detailed in paragraph (f) of this section and consistent with other requirements contained in this part, a railroad and the representatives of the railroad's

employees may submit, for FRA approval, a joint proposal containing a plan designating locations where brake system repairs will be performed. Approval of such plans shall be made in writing by FRA's Associate Administrator for Safety and shall be subject to any modifications or changes determined by FRA to be necessary to ensure consistency with the requirements and guidance contained in this part.

#### § 232.17 Special approval procedure.

(a) *General.* The following procedures govern consideration and action upon requests for special approval of an alternative standard under §§ 232.305 and 232.307; and for special approval of pre-revenue service acceptance testing plans under subpart F of this part.

(b) *Petitions for special approval of an alternative standard.* Each petition for special approval of an alternative standard shall contain:

(1) The name, title, address, and telephone number of the primary person to be contacted with regard to review of the petition;

(2) The alternative proposed, in detail, to be substituted for the particular requirement of this part;

(3) Appropriate data or analysis, or both, for FRA to consider in determining whether the alternative will provide at least an equivalent level of safety; and

(4) A statement affirming that the railroad has served a copy of the petition on designated representatives of its employees, together with a list of the names and addresses of the persons served.

(c) *Petitions for special approval of pre-revenue service acceptance testing plan.* Each petition for special approval of a pre-revenue service acceptance testing plan shall contain:

(1) The name, title, address, and telephone number of the primary person to be contacted with regard to review of the petition; and

(2) The elements prescribed in § 232.505.

(d) *Service.*

(1) Each petition for special approval under paragraph (b) or (c) of this section shall be submitted in triplicate to the Associate Administrator for Safety, Federal Railroad Administration, 400 7th Street, SW., Washington, DC 20590.

(2) Service of each petition for special approval of an alternative standard under paragraph (b) of this section shall be made on the following:

(i) Designated employee representatives responsible for the equipment's operation, inspection, testing, and maintenance under this part;

(ii) Any organizations or bodies that either issued the standard incorporated in the section(s) of the rule to which the special approval pertains or issued the alternative standard that is proposed in the petition; and

(iii) Any other person who has filed with FRA a current statement of interest in reviewing special approvals under the particular requirement of this part at least 30 days but not more than 5 years prior to the filing of the petition. If filed, a statement of interest shall be filed with FRA's Associate Administrator for Safety and shall reference the specific section(s) of this part in which the person has an interest.

(e) *Federal Register notice.* FRA will publish a notice in the **Federal Register** concerning each petition under paragraph (b) of this section.

(f) *Comment.* Not later than 30 days from the date of publication of the notice in the **Federal Register** concerning a petition under paragraph (b) of this section, any person may comment on the petition.

(1) A comment shall set forth specifically the basis upon which it is made, and contain a concise statement of the interest of the commenter in the proceeding.

(2) The comment shall be submitted in triplicate to the Associate Administrator for Safety, Federal Railroad Administration, 400 7th Street, SW., Washington, DC 20590.

(3) The commenter shall certify that a copy of the comment was served on each petitioner.

(g) *Disposition of petitions.*

(1) If FRA finds that the petition complies with the requirements of this section and that the proposed alternative standard or pre-revenue service plan is acceptable and justified, the petition will be granted, normally within 90 days of its receipt. If the petition is neither granted nor denied within 90 days, the petition remains pending for decision. FRA may attach special conditions to the approval of any petition. Following the approval of a petition, FRA may reopen consideration of the petition for cause.

(2) If FRA finds that the petition does not comply with the requirements of this section and that the alternative standard or pre-revenue service plan is not acceptable or justified, the petition will be denied, normally within 90 days of its receipt.

(3) When FRA grants or denies a petition, or reopens consideration of the petition, written notice is sent to the petitioner and other interested parties.

#### § 232.19 Availability of records.

Except as otherwise provided, the records and plans required by this part shall be made available to representatives of FRA and States participating under part 212 of this chapter for inspection and copying upon request.

#### § 232.21 Information Collection.

(a) The information collection requirements of this part were reviewed by the Office of Management and Budget pursuant to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) and are assigned OMB control number 2130-0008.

(b) The information collection requirements are found in the following sections: §§ 229.27, 231.31, 232.1, 232.3, 232.7, 232.11, 232.15, 232.17, 232.103, 232.105, 232.107, 232.109, 232.111, 232.203, 232.205, 232.207, 232.209, 232.211, 232.213, 232.303, 232.307, 232.309, 232.403, 232.405, 232.407, 232.409, 232.503, 232.505.

### Subpart B—General Requirements

#### § 232.101 Scope.

This subpart contains general operating, performance, and design requirements for each railroad that operates freight or other non-passenger trains and for specific equipment used in those operations.

#### § 232.103 General requirements for all train brake systems.

(a) The primary brake system of a train shall be capable of stopping the train with a service application from its maximum operating speed within the signal spacing existing on the track over which the train is operating.

(b) If the integrity of the train line of a train brake system is broken, the train shall be stopped. If a train line uses other than solely pneumatic technology, the integrity of the train line shall be monitored by the brake control system.

(c) A train brake system shall respond as intended to signals from the train line.

(d) One hundred percent of the brakes on a train shall be effective and operative brakes prior to use or departure from any location where a Class I brake test is required to be performed on the train pursuant to § 232.205.

(e) A train shall not move if less than 85 percent of the cars in that train have operative and effective brakes.

(f) Each car in a train shall have its air brakes in effective operating condition unless the car is being moved for repairs in accordance with § 232.15. The air brakes on a car are not in effective

operating condition if its brakes are cut-out or otherwise inoperative or if the piston travel exceeds:

(1) 10½ inches for cars equipped with nominal 12-inch stroke brake cylinders; or

(2) The piston travel limits indicated on the stencil, sticker, or badge plate for the brake cylinder with which the car is equipped.

(g) Except for cars equipped with nominal 12-inch stroke (8½ and 10-inch diameters) brake cylinders, all cars shall have a legible decal, stencil, or sticker affixed to the car or shall be equipped with a badge plate displaying the permissible brake cylinder piston travel range for the car at Class I brake tests and the length at which the piston travel renders the brake ineffective, if different from Class I brake test limits. The decal, stencil, sticker, or badge plate shall be located so that it may be easily read and understood by a person positioned safely beside the car.

(h) All equipment ordered on or after August 1, 2002, or placed in service for the first time on or after April 1, 2004, shall have train brake systems designed so that an inspector can observe from a safe position either the piston travel, an accurate indicator which shows piston travel, or any other means by which the brake system is actuated. The design shall not require the inspector to place himself or herself on, under, or between components of the equipment to observe brake actuation or release.

(i) All trains shall be equipped with an emergency application feature that produces an irretrievable stop, using a brake rate consistent with prevailing adhesion, train safety, and brake system thermal capacity. An emergency application shall be available at all times, and shall be initiated by an unintentional parting of the train line or loss of train brake communication.

(j) A railroad shall set the maximum main reservoir working pressure.

(k) The maximum brake pipe pressure shall not be greater than 15 psi less than

the air compressor governor starting or loading pressure.

(l) Except as otherwise provided in this part, all equipment used in freight or other non-passenger trains shall, at a minimum, meet the Association of American Railroads (AAR) Standard S-469-47, "Performance Specification for Freight Brakes," contained in the AAR *Manual of Standards and Recommended Practices, Section E* (April 1, 1999). The incorporation by reference of this AAR standard was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of the incorporated document from the Association of American Railroads, 50 F Street, NW, Washington, DC. 20001. You may inspect a copy of the document at the Federal Railroad Administration, Docket Clerk, 1120 Vermont Avenue, NW, Suite 7000, Washington, DC or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408.

(m) If a train qualified by the Air Flow Method as provided for in subpart C of this part experiences a brake pipe air flow of greater than 60 CFM or brake pipe gradient of greater than 15 psi while en route and the movable pointer does not return to those limits within a reasonable time, the train shall be stopped at the next available location and be inspected for leaks in the brake system.

(n) *Securement of unattended equipment.* A train's air brake shall not be depended upon to hold equipment standing unattended on a grade (including a locomotive, a car, or a train whether or not locomotive is attached). For purposes of this section, "unattended equipment" means equipment left standing and unmanned in such a manner that the brake system of the equipment cannot be readily controlled by a qualified person. Unattended equipment shall be secured

in accordance with the following requirements:

(1) A sufficient number of hand brakes shall be applied to hold the equipment. Railroads shall develop and implement a process or procedure to verify that the applied hand brakes will sufficiently hold the equipment with the air brakes released.

(2) Where possible, an emergency brake application of the air brakes shall be initiated prior to leaving equipment unattended.

(3) The following requirements apply to the use of hand brakes on unattended locomotives:

(i) All hand brakes shall be fully applied on all locomotives in the lead consist of an unattended train.

(ii) All hand brakes shall be fully applied on all locomotives in an unattended locomotive consist outside of yard limits.

(iii) At a minimum, the hand brake shall be fully applied on the lead locomotive in an unattended locomotive consist within yard limits.

(4) A railroad shall adopt and comply with a process or procedures to verify that the applied hand brakes will sufficiently hold an unattended locomotive consist. A railroad shall also adopt and comply with instructions to address throttle position, status of the reverse lever, position of the generator field switch, status of the independent brakes, position of the isolation switch, and position of the automatic brake valve on all unattended locomotives. The procedures and instruction required in this paragraph shall take into account winter weather conditions as they relate to throttle position and reverser handle.

(5) Any hand brakes applied to hold unattended equipment shall not be released until it is known that the air brake system is properly charged.

(o) Air pressure regulating devices shall be adjusted for the following pressures:

Locomotives	PSI
(1) Minimum brake pipe air pressure:	
Road Service .....	90
Switch Service .....	60
(2) Minimum differential between brake pipe and main reservoir air pressures, with brake valve in running position .....	15
(3) Safety valve for straight air brake .....	30-55
(4) Safety valve for LT, ET, No. 8-EL, No. 14 EI, No. 6-DS, No. 6-BL and No. 6-SL equipment .....	30-68
(5) Safety valve for HSC and No. 24-RL equipment .....	30-75
(6) Reducing valve for independent or straight air brake .....	30-50
(7) Self-lapping portion for electro-pneumatic brake (minimum full application pressure) .....	50
(8) Self-lapping portion for independent air brake (full application pressure) .....	30 or less
(9) Reducing valve for high-speed brake (minimum) .....	50

(p) Railroad or contract supervisors shall be held jointly responsible with

the inspectors and train crew members they supervise for the condition and

proper functioning of train brake systems to the extent that it is possible

to detect defective equipment by the inspections and tests required by this part.

**§ 232.105 General requirements for locomotives.**

(a) The air brake equipment on a locomotive shall be in safe and suitable condition for service.

(b) All locomotives ordered on or after August 1, 2002, or placed in service for the first time on or after April 1, 2004, shall be equipped with a hand or parking brake that is:

(1) Capable of application or activation by hand;

(2) Capable of release by hand; and

(3) Capable of holding the unit on a three (3) percent grade.

(c) On locomotives so equipped, the hand or parking brake as well as its parts and connections shall be inspected, and necessary repairs made, as often as service requires but no less frequently than every 368 days. The date of the last inspection shall be either entered on Form FRA F 6180-49A or suitably stenciled or tagged on the locomotive.

(d) The amount of leakage from the equalizing reservoir on locomotives and related piping shall be zero, unless the system is capable of maintaining the set pressure at any service application with the brakes control valve in the freight position. If such leakage is detected en route, the train may be moved only to the nearest forward location where the equalizing-reservoir leakage can be corrected. On locomotives equipped with electronic brakes, if the system logs or displays a fault related to equalizing reservoir leakage, the train may be moved only to the nearest forward location where the necessary repairs can be made.

(e) Use of the feed or regulating valve to control braking is prohibited.

(f) The passenger position on the locomotive brake control stand shall be used only if the trailing equipment is designed for graduated brake release or if equalizing reservoir leakage occurs en route and its use is necessary to safely control the movement of the train until it reaches the next forward location where the reservoir leakage can be corrected.

(g) When taking charge of a locomotive or locomotive consist, an engineer must know that the brakes are in operative condition.

**§ 232.107 Air source requirements and cold weather operations.**

(a) *Monitoring plans for yard air sources.*

(1) A railroad shall adopt and comply with a written plan to monitor all yard

air sources, other than locomotives, to determine that they operate as intended and do not introduce contaminants into the brake system of freight equipment.

(2) This plan shall require the railroad to:

(i) Inspect each yard air source at least two times per calendar year, no less than five months apart, to determine it operates as intended and does not introduce contaminants into the brake system of the equipment it services.

(ii) Identify yard air sources found not to be operating as intended or found introducing contaminants into the brake system of the equipment it services.

(iii) Repair or take other remedial action regarding any yard air source identified under paragraph (a)(2)(ii) of this section.

(3) A railroad shall maintain records of the information and actions required by paragraph (a)(2). These records shall be maintained for a period of at least one year from the date of creation and may be maintained either electronically or in writing.

(b) Condensation and other contaminants shall be blown from the pipe or hose from which compressed air is taken prior to connecting the yard air line or motive power to the train.

(c) No chemicals which are known to degrade or harm brake system components shall be placed in the train air brake system.

(d) Yard air reservoirs shall either be equipped with an operable automatic drain system or be manually drained at least once each day that the devices are used or more often if moisture is detected in the system.

(e) A railroad shall adopt and comply with detailed written operating procedures tailored to the equipment and territory of that railroad to cover safe train operations during cold weather. For purposes of this provision, "cold weather" means when the ambient temperature drops below 10 degrees Fahrenheit (F) (minus 12.2 degrees Celsius).

**§ 232.109 Dynamic brake requirements.**

(a) Except as provided in paragraph (i) of this section, a locomotive engineer shall be informed of the operational status of the dynamic brakes on all locomotive units in the consist at the initial terminal or point of origin for a train and at other locations where a locomotive engineer first begins operation of a train. The information required by this paragraph may be provided to the locomotive engineer by any means determined appropriate by the railroad; however, a written or electronic record of the information

shall be maintained in the cab of the controlling locomotive.

(b) Except as provided in paragraph (e) of this section, all inoperative dynamic brakes shall be repaired within 30 calendar days of becoming inoperative or at the locomotive's next periodic inspection pursuant to § 229.23 of this chapter, whichever occurs first.

(c) Except as provided in paragraph (e) of this section, a locomotive discovered with inoperative dynamic brakes shall have a tag bearing the words "inoperative dynamic brake" securely attached and displayed in a conspicuous location in the cab of the locomotive. This tag shall contain the following information:

(1) The locomotive number;

(2) The name of the discovering carrier;

(3) The location and date where condition was discovered; and

(4) The signature of the person discovering the condition.

(d) An electronic or written record of repairs made to a locomotive's dynamic brakes shall be retained for 92 days.

(e) A railroad may elect to declare the dynamic brakes on a locomotive deactivated without removing the dynamic brake components from the locomotive, only if all of the following conditions are met:

(1) The locomotive is clearly marked with the words "dynamic brake deactivated" in a conspicuous location in the cab of the locomotive; and

(2) The railroad has taken appropriate action to ensure that the deactivated locomotive is incapable of utilizing dynamic brake effort to retard or control train speed.

(f) If a locomotive consist is intended to have its dynamic brakes used while in transit, a locomotive with inoperative or deactivated dynamic brakes or a locomotive not equipped with dynamic brakes shall not be placed in the controlling (lead) position of a consist unless the locomotive has the capability of:

(1) Controlling the dynamic braking effort in trailing locomotives in the consist that are so equipped; and

(2) Displaying to the locomotive engineer the deceleration rate of the train or the total train dynamic brake retarding force.

(g) All locomotives equipped with dynamic brakes and ordered on or after August 1, 2002, or placed in service for the first time on or after April 1, 2004, shall be designed to:

(1) Test the electrical integrity of the dynamic brake at rest; and

(2) Display the available total train dynamic brake retarding force at various speed increments in the cab of the controlling (lead) locomotive.

(h) All rebuilt locomotives equipped with dynamic brakes and placed in service on or after April 1, 2004, shall be designed to:

(1) Test the electrical integrity of the dynamic brake at rest; and

(2) Display either the train deceleration rate or the available total train dynamic brake retarding force at various speed increments in the cab of the controlling (lead) locomotive.

(i) The information required by paragraph (a) of this section is not required to be provided to the locomotive engineer if all of the locomotives in the lead consist of a train are equipped in accordance with paragraph (g) of this section.

(j) A railroad operating a train with a brake system that includes dynamic brakes shall adopt and comply with written operating rules governing safe train handling procedures using these dynamic brakes under all operating conditions, which shall be tailored to the specific equipment and territory of the railroad. The railroad's operating rules shall:

(1) Ensure that the friction brakes are sufficient by themselves, without the aid of dynamic brakes, to stop the train safely under all operating conditions.

(2) Include a "miles-per-hour-overspeed-stop" rule. At a minimum, this rule shall require that any train, when descending a grade of 1 percent or greater, shall be immediately brought to a stop, by an emergency brake application if necessary, when the train's speed exceeds the maximum authorized speed for that train by more than 5 miles per hour. A railroad shall reduce the 5 mile per hour overspeed restriction if validated research indicates the need for such a reduction. A railroad may increase the 5 mile per hour overspeed restriction only with approval of FRA and based upon verifiable data and research.

(k) A railroad operating a train with a brake system that includes dynamic brakes shall adopt and comply with specific knowledge, skill, and ability criteria to ensure that its locomotive engineers are fully trained in the operating rules prescribed by paragraph (j) of this section. The railroad shall incorporate such criteria into its locomotive engineer certification program pursuant to Part 240 of this chapter.

#### **§ 232.111 Train handling information.**

(a) A railroad shall adopt and comply with written procedures to ensure that a train crew employed by the railroad is given accurate information on the condition of the train brake system and train factors affecting brake system

performance and testing when the crew takes over responsibility for the train.

The information required by this paragraph may be provided to the locomotive engineer by any means determined appropriate by the railroad; however, a written or electronic record of the information shall be maintained in the cab of the controlling locomotive.

(b) The procedures shall require that each train crew taking charge of a train be informed of:

(1) The total weight and length of the train, based on the best information available to the railroad;

(2) Any special weight distribution that would require special train handling procedures;

(3) The number and location of cars with cut-out or otherwise inoperative brakes and the location where they will be repaired;

(4) If a Class I or Class IA brake test is required prior to the next crew change point, the location at which that test shall be performed; and

(5) Any train brake system problems encountered by the previous crew of the train.

#### **Subpart C—Inspection and Testing Requirements**

##### **§ 232.201 Scope.**

This subpart contains the inspection and testing requirements for brake systems used in freight and other non-passenger trains. This subpart also contains general training requirements for railroad and contract personnel used to perform the required inspections and tests.

##### **§ 232.203 Training requirements.**

(a) Each railroad and each contractor shall adopt and comply with a training, qualification, and designation program for its employees that perform brake system inspections, tests, or maintenance. For purposes of this section, a "contractor" is defined as a person under contract with the railroad or car owner. The records required by this section may be maintained either electronically or in writing.

(b) As part of this program, the railroad or contractor shall:

(1) Identify the tasks related to the inspection, testing, and maintenance of the brake system required by this part that must be performed by the railroad or contractor and identify the skills and knowledge necessary to perform each task.

(2) Develop or incorporate a training curriculum that includes both classroom and "hands-on" lessons designed to impart the skills and knowledge identified as necessary to perform each

task. The developed or incorporated training curriculum shall specifically address the Federal regulatory requirements contained in this part that are related to the performance of the tasks identified.

(3) Require all employees to successfully complete a training curriculum that covers the skills and knowledge the employee will need to possess in order to perform the tasks required by this part that the employee will be responsible for performing, including the specific Federal regulatory requirements contained in this part related to the performance of a task for which the employee will be responsible;

(4) Require all employees to pass a written or oral examination covering the skills and knowledge the employee will need to possess in order to perform the tasks required by this part that the employee will be responsible for performing, including the specific Federal regulatory requirements contained in this part related to the performance of a task for which the employee will be responsible for performing;

(5) Require all employees to individually demonstrate "hands-on" capability by successfully applying the skills and knowledge the employee will need to possess in order to perform the tasks required by this part that the employee will be responsible for performing to the satisfaction of the employee's supervisor or designated instructor;

(6) Consider training and testing, including efficiency testing, previously received by an employee in order to meet the requirements contained in paragraphs (b)(3) through (b)(5) of this section; provided, such training and testing can be documented as required in paragraph (e) of this section;

(7) Require supervisors to exercise oversight to ensure that all the identified tasks are performed in accordance with the railroad's written procedures and the specific Federal regulatory requirements contained in this part;

(8) Require periodic refresher training at an interval not to exceed three years that includes classroom and "hands-on" training, as well as testing. Efficiency testing may be used to meet the "hands-on" portion of this requirement; provided, such testing is documented as required in paragraph (e) of this section; and

(9) Add new brake systems to the training, qualification and designation program prior to its introduction to revenue service.

(c) A railroad that operates trains required to be equipped with a two-way

end-of-train telemetry device pursuant to Subpart E of this part, and each contractor that maintains such devices shall adopt and comply with a training program which specifically addresses the testing, operation, and maintenance of two-way end-of-train devices for employees who are responsible for the testing, operation, and maintenance of the devices.

(d) A railroad that operates trains under conditions that require the setting of air brake pressure retaining valves shall adopt and comply with a training program which specifically addresses the proper use of retainers for employees who are responsible for using or setting retainers.

(e) A railroad or contractor shall maintain adequate records to demonstrate the current qualification status of all of its personnel assigned to inspect, test, or maintain a train brake system. The records required by this paragraph may be maintained either electronically or in writing and shall be provided to FRA upon request. These records shall include the following information concerning each such employee:

- (1) The name of the employee;
  - (2) The dates that each training course was completed;
  - (3) The content of each training course successfully completed;
  - (4) The employee's scores on each test taken to demonstrate proficiency;
  - (5) A description of the employee's "hands-on" performance applying the skills and knowledge the employee needs to possess in order to perform the tasks required by this part that the employee will be responsible for performing and the basis for finding that the skills and knowledge were successfully demonstrated;
  - (6) A record that the employee was notified of his or her current qualification status and of any subsequent changes to that status;
  - (7) The tasks required to be performed under this part which the employee is deemed qualified to perform; and
  - (8) Identification of the person(s) determining that the employee has successfully completed the training necessary to be considered qualified to perform the tasks identified in paragraph (e)(7) of this section.
- (9) The date that the employee's status as qualified to perform the tasks identified in paragraph (e)(7) of this section expires due to the need for refresher training.

(f) A railroad or contractor shall adopt and comply with a plan to periodically assess the effectiveness of its training program. One method of validation and assessment could be through the use of

efficiency tests or periodic review of employee performance.

**§ 232.205 Class I brake test-initial terminal inspection.**

(a) Each train and each car in the train shall receive a Class I brake test as described in paragraph (b) of this section by a qualified person, as defined in § 232.5, at the following points:

- (1) The location where the train is originally assembled ("initial terminal");
  - (2) A location where the train consist is changed other than by:
    - (i) Adding a single car or a solid block of cars;
    - (ii) Removing a single car or a solid block of cars;
    - (iii) Removing cars determined to be defective under this chapter; or
    - (iv) A combination of the changes listed in paragraphs (a)(2)(i) through (a)(2)(iii) of this section (See §§ 232.209 and 232.211 for requirements related to the pick-up of cars and solid blocks of cars en route.);
  - (3) A location where the train is off air for a period of more than four hours;
  - (4) A location where a unit or cycle train has traveled 3,000 miles since its last Class I brake test; and
  - (5) A location where the train is received in interchange if the train consist is changed other than by:
    - (i) Removing a car or a solid block of cars from the train;
    - (ii) Adding a previously tested car or a previously tested solid block of cars to the train;
    - (iii) Changing motive power;
    - (iv) Removing or changing the caboose; or
    - (v) Any combination of the changes listed in paragraphs (a)(5) of this section.
- (A) If changes other than those contained in paragraph (a)(5)(i)-(a)(5)(v) of this section are made to the train consist when it is received in interchange and the train will move 20 miles or less, then the railroad may conduct a brake test pursuant to § 232.209 on those cars added to the train.

(B) Reserved.

(b) A Class I brake test of a train shall consist of the following tasks and requirements:

(1) Brake pipe leakage shall not exceed 5 psi per minute or air flow shall not exceed 60 cubic feet per minute (CFM).

(i) *Leakage Test.* The brake pipe leakage test shall be conducted as follows:

(A) Charge the air brake system to the pressure at which the train will be operated, and the pressure at the rear of

the train shall be within 15 psi of the pressure at which the train will be operated, but not less than 75 psi, as indicated by an accurate gauge or end-of-train device at the rear end of train;

(B) Upon receiving the signal to apply brakes for test, make a 20-psi brake pipe service reduction;

(C) If the locomotive used to perform the leakage test is equipped with a means for maintaining brake pipe pressure at a constant level during a 20-psi brake pipe service reduction, this feature shall be cut out during the leakage test; and

(D) With the brake valve lapped and the pressure maintaining feature cut out (if so equipped) and after waiting 45-60 seconds, note the brake pipe leakage as indicated by the brake-pipe gauge in the locomotive, which shall not exceed 5 psi per minute.

(ii) *Air Flow Method Test.* When a locomotive is equipped with a 26-L brake valve or equivalent pressure maintaining locomotive brake valve, a railroad may use the Air Flow Method Test as an alternate to the brake pipe leakage test. The Air Flow Method (AFM) Test shall be performed as follows:

(A) Charge the air brake system to the pressure at which the train will be operated, and the pressure at the rear of the train shall be within 15 psi of the pressure at which the train will be operated, but not less than 75 psi, as indicated by an accurate gauge or end-of-train device at the rear end of train; and

(B) Measure air flow as indicated by a calibrated AFM indicator, which shall not exceed 60 cubic feet per minute (CFM).

(iii) The AFM indicator shall be calibrated for accuracy at periodic intervals not to exceed 92 days. The AFM indicator calibration test orifices shall be calibrated at temperatures of not less than 20 degrees Fahrenheit. AFM indicators shall be accurate to within  $\pm 3$  standard cubic feet per minute (CFM).

(2) The inspector shall position himself/herself, taking positions on each side of each car sometime during the inspection process, so as to be able to examine and observe the functioning of all moving parts of the brake system on each car in order to make the determinations and inspections required by this section. A "roll-by" inspection of the brake release as provided for in paragraph (b)(8) of this section shall not constitute an inspection of that side of the train for purposes of this requirement;

(3) The train brake system shall be charged to the pressure at which the